

COMPUTERWORLD

United takes distributed approach

BY ELLIS BOOKER
CW STAFF

CHICAGO — United Airlines is on its final approach to realizing a client/server computing strategy that should smooth airport processing considerably.

By June, United will have placed some 2,000 Microsoft Corp. Windows-based workstations, along with 150 servers running OS/2, in all its major hubs. The systems will serve two purposes: to provide access to United's four main host-based applications using terminal emulation under Windows and to act as a platform for true client/server applications, some of which have already been put into use.

While United executives declined to specify the extent of the company's investment, sources close to the airline said it has committed some \$13 million to the hardware, software and network infrastructure that make up the client/server upgrade. That's peanuts compared with the company's annual information systems budget of about \$300 million, according to *Computerworld* estimates.

Don Karmazin, vice president of MIS at Un-

ited's Elk Grove Village, Ill., headquarters, has led the client/server strategy since its earliest days. He said he believes United is ahead of its competitors, all of which are installing intelligent workstations in their airport terminals. Collectively, the new systems will make the processing of passengers "more straightforward, consistent and accurate," Karmazin said.

The installations mark the end of a process that began in 1987, when United opened its showcase Terminal One at O'Hare International Airport here.

"Mainframe systems aren't easy to change, and they were limiting our ability to provide tools to our people," said Jean-Pierre Wetli, manager of applications development at United's MIS division.

Workstations and servers will not immediately displace United's many mainframe-based applications, nor will they spell the end of the centralized passenger reservation system it depends on. But true client/server applications are springing up quickly and have already pointed the way toward a different method of handling problems and satisfying the needs of United's passengers.

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Flying with client/server

At Chicago's O'Hare Airport, United has installed 400 workstations and more than 40 servers. The typical configuration is as follows:

Workstation Phillips diskless machine with 4M bytes of RAM running Microsoft's Windows 3.0.

Server IBM PS/2 Model 95 with 16M bytes of RAM running OS/2 1.3.

Network LAN Manager ties together the Token Ring LANs inside the terminal; the servers connect to a variety of hosts via IBM's SNA.

HP stacks chips in RISC game with DEC

Claims rival processor will arrive before Alpha

BY MARYFRAN JOHNSON
CW STAFF

NEW YORK — Hewlett-Packard Co. executives vowed last week to ship "Alpha-class systems in volume" months before Digital Equipment Corp. can get substantial numbers of its new Alpha RISC-based machines on the market next year.

HP is already producing several hundred of its next-generation Precision Architecture-Reduced Instruction Set Computing 7100 chips weekly, company officials confirmed.

"We'll be rolling over our entire line to the new chips and offering board upgrades by the end of the year," said Jim Bell, an HP vice president and newly appointed president of the Precision RISC Organization.

More to come

Yet analysts and users said that ramping up to volume production only weeks after unveiling details of the latest PA-RISC processor signals even earlier

delivery dates for new models of HP's premier commercial computers: the HP 9000 Series 800 and HP 3000 line.

The PA-RISC 7100 chip is a superscalar, 100-MHz processor that is expected to deliver at least 120 SPECmarks of performance. It is code-named T-Bird, after the tiny Thunderbird design etched on each chip.

"It wouldn't surprise me in the least if HP is [also] doing special-purpose systems for some customers," said Gordon Kerr, vice president of information systems at Hyatt Hotel Corp. in Chicago. Hyatt runs its reservation system on Series 800 Unix-based midrange machines.

While DEC is expected to have some Alpha RISC systems out by next fall, it will be well into 1993 before a full Alpha product line rolls out.

"DEC will also be at a disadvantage as it moves its VMS [operating system] base to Alpha, so that slows down the rate at which the firm can capitalize

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User skepticism impels IBM to remix desktop strategy

Big Blue explores unorthodox approaches to OS/2 pricing, promos and distribution

BY ROSEMARY HAMILTON
CW STAFF

WHITE PLAINS, N.Y. — The Corner Store, a tiny general merchandise shop located in Litchfield, Conn., recently asked IBM if it could resell OS/2 2.0. Owner Paul Pignatelli was not sure what the response would be, and he was quite surprised when an IBM executive contacted him to

accept his proposal.

Next month, The Corner Store will stock its shelves with copies of OS/2 2.0 alongside art supplies, stationery and novelty items.

Apparently, IBM was not kidding when it said it intends to market OS/2 through every conceivable channel.

This grass-roots effort is one piece of a marketing blitz the

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Name alone won't win PC sales or restore customer confidence

BY MICHAEL FITZGERALD
and CAROL HILDEBRAND
CW STAFF

ARMONK, N.Y. — IBM may not be the Rodney Dangerfield of personal computing, but the company is clearly fighting an uphill battle to regain user respect and confidence.

Allan Ditchfield, chief information officer at The Progressive Corp., an insurance firm in Mayfield Heights, Ohio, said that if IBM's new products were up to par with the rest of the market, he would look at them, but buying for the IBM name alone is out.

"I'm buying in real time," Ditchfield said. "If their note-

book works now, has good mid-range interfaces and software at a good price, I'm interested. But I'm a situational buyer — I don't

buy on tradition anymore," he said.

"I don't know what would bring me back," said William Tignanello, assistant vice president of information systems at the Federal Reserve Bank in Baltimore. "They'd almost have to bring some PCs over here and let us use them and see if they were

[worthwhile]." IBM officials said they understand user concerns and have been working on a divisional makeover since long before December's corporate reorganization. While users agree IBM has

progressed, they also say there is much room for improvement, a view with which IBM concurs.

"We certainly haven't reached the seventh day to take

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"I hope Microsoft doesn't screw up FoxPro. One minute they'll support a platform and the next, it's the worst thing you can use."

ROCK BLANCO
GARBER TRAVEL

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EXECUTIVE BRIEFING

■ **Information systems managers and their companies** are increasingly being held liable for errors and damages caused by faulty software and systems. For computing professionals, this can mean lost credibility, lost jobs, shattered reputations and ruined careers. However, consultants and lawyers say few IS managers are taking steps to minimize liability. **Page 85.**

■ **IBM** readies an **OS/2 2.0** marketing plan that includes a grass-roots effort by company employees to help sell the software. In addition, **IBM** is expected to come out with lowball prices and an 'aggressive' advertising campaign later this month. **Page 1.** On a technical note, **IBM** is bringing out a serious PC operating system that seems to be robust, user-friendly, sophisticated — and large. **Page 12.**

■ **Maybe you don't have to choose between Windows and OS/2 yet.** Some users have found ways to focus on one of those operating environments while keeping the door ajar for the other. **Page 35.** One company that has incorporated both systems is **United Airlines**, which is rolling out a network of 2,000 Windows-based workstations and 150 OS/2-based servers. **Page 1.**

■ **IBM** is laying the foundation for its **Information Warehouse** by providing more details about its partners and the products that will support its distributed database framework. **Page 4.**

■ **New legal concerns surface in connection with outsourcing.** Eleven former **Kodak** employees have hit **Kodak** and outsourcing contractor **DEC** with a lawsuit, charging that **DEC** misled and coerced them into going to work for **DEC**. **Page 24.**

■ **January's outsourcing deal** between **Blue Cross/Blue Shield** of Massachusetts and **EDS** results in layoffs for 92 IS employees transferred to **EDS**. **Page 24.**

■ **Some users cite concerns about Apple's decision to allow greater customization of the Macintosh interface.** Managers at **Macintosh** sites are worried about support challenges that may crop up if users implement too many variations of the **Macintosh** screen. **Page 35.**

■ **Tandem's Unix-based fault-tolerant offering has been less than a smash hit,** at least outside of a few niche markets. After

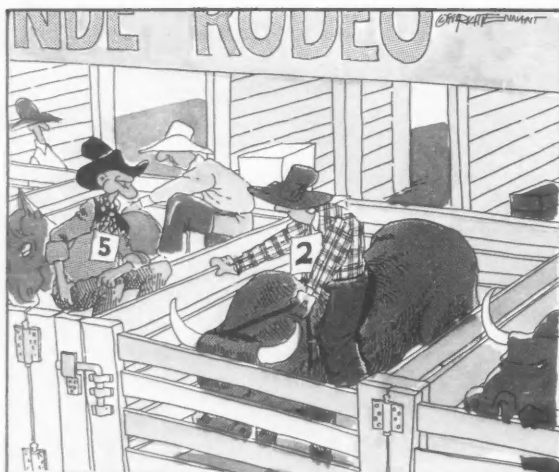
two years, the **Integrity** series shows up primarily in the telecom arena. **Page 75.**

■ **Eighteen years after it first unveiled SNA,** **IBM** has crowned its APPN architecture as the enterprise networking architecture for the 21st century. **IBM** shops will soon be able to migrate their mainframe applications to APPN services. However, getting mixed LAN shops to adopt APPN as their primary internetworking strategy could prove a tough sell. **Page 6.**

■ **Virtual reality may become a commercial reality someday.** Researchers are working on ways to bring virtual reality out of the entertainment world and into the business world, perhaps in areas such as product design. **Page 93.** Meanwhile, new uses are still showing up in the entertainment sector, where a **San Francisco** stage company has brought computer-generated beings into live theater. **Page 31.**

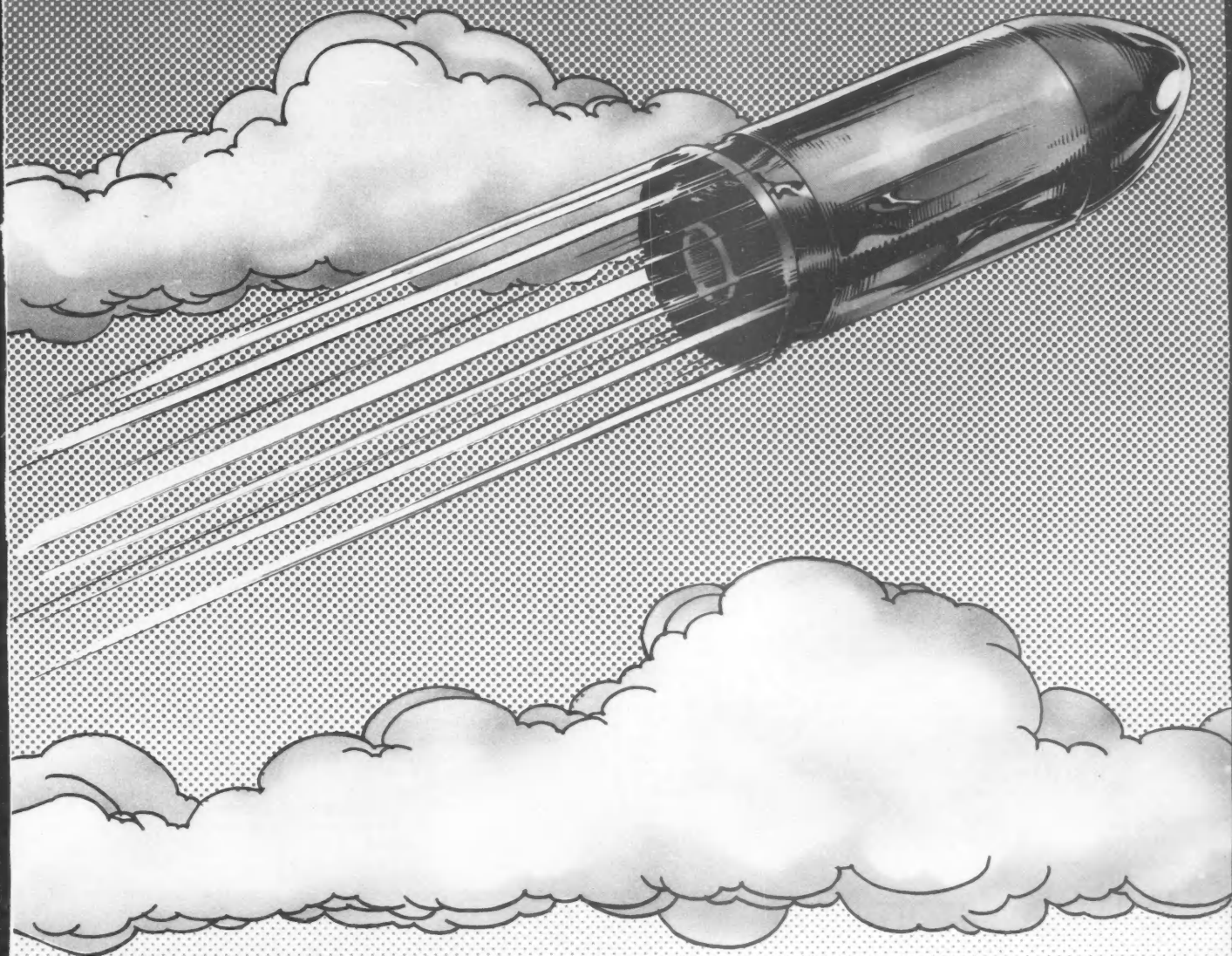
■ **On site this week:** New electronic banking offerings are made possible with the addition of fault-tolerant systems at **Bank Brussels Lambert** in Belgium. **Page 78.** **Holiday Inn** has a plan for using information technology in new ways and is investing \$60 million in Unix-based front desk and reservation systems. **Page 75.** The **OSI** model for networking has won a convert: the French national railway. **Page 69.** It's time to write code and convert applications at **Haggar Apparel**, where a mainframe is being replaced by several **IBM AS/400** processors. **Page 81.**

The 5th Wave

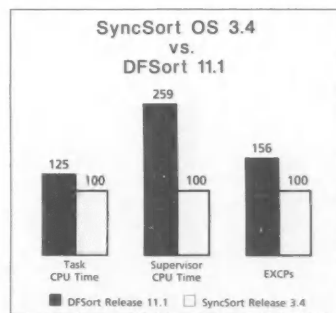


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Microsoft makes Fox-y move

Buys Fox Software for \$175M, hoping for slice of database market pie

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp.'s planned purchase of Fox Software, Inc. and its Foxbase technology for about \$175 million has set the stage for a summertime donnybrook in the Windows database world — possibly the last unclaimed territory in the desktop software market.

Announced last week, the planned acquisition squarely moves the developer into direct competition with Borland International, Inc. — the leader in the \$1 billion database market, with an estimated 65% share. While Microsoft excels in a wide variety of applications, databases have been noticeably missing from its portfolio. The firm has worked for years on a database program, code-named Cirrus, but has run into snags.

Although some analysts said the buyout was too costly, it allows Microsoft to go after Borland's customers immediately. By purchasing dBase clone maker Fox, Microsoft nets about 50 skilled database engineers, a well-respected technology, an

enthusiastic user base and a shipping schedule that is expected to yield FoxPro versions for the Windows, Unix and Apple Computer, Inc. Macintosh markets,



Microsoft's Gates leads firm where it has never gone before: database software

beginning this summer.

Borland Chief Executive Officer Philippe Kahn called the announcement "great news," adding that Microsoft has adopted a technology based on Borland's dBase instead of its own Visual Basic because "Microsoft's database efforts were not going that well." However, Borland's stock fell \$7.25 per share the day of the announcement.

Microsoft will eventually offer a "family" of database pro-

grams as well as the software needed to write new database programs, Microsoft CEO Bill Gates said.

Many FoxPro users said they were thrilled by the announcement. "I've been giggling with pleasure since I heard the news," said Alan Griver, a partner at consulting firm Flash Creative Management, Inc. in Teaneck, N.J. "Two companies like Borland and Microsoft duking it out, working hard to outdo each other in features and prices — how can we lose?"

Users losing faith

However, one concern is Microsoft's recent abandonment of support for OS/2. "I hope Microsoft doesn't screw up FoxPro," said Rock Blanco, who has recently begun moving applications over from dBase to FoxPro in his position as vice president of information systems at Garber Travel Services, Inc. in Boston. "One minute they'll support a platform and the next it's the worst thing you can use."

Founded in 1983, the privately held Fox has grown to about \$75 million in sales with a high-

speed database built on the same programming languages and file structure that dBase uses.

The merger, which is subject to government approval, is expected to be completed during Microsoft's fourth fiscal quarter, which ends June 30. Microsoft will exchange approximately 1.36 million shares of its common stock for all of Fox's outstanding stock, making the deal worth approximately \$175 million at last week's market prices.

No lost opportunities

International Data Corp. analyst Nancy McSharry said the purchase price was too high, but "when Microsoft sees an opportunity, very little stands in their way."

Although Fox's database experts will help combine the two technologies in the future, for now, FoxPro will hold down the low end of that spectrum while Cirrus will serve enterprisewide computing needs. Cirrus is going into beta testing soon and is scheduled to be available to users by year's end, Gates said.

Analysts said Microsoft's immediate challenge is to articulate its database strategy very quickly to users. Microsoft "has picked up a loaded gun; now they just have to learn to shoot it," said John Dunkle, president of Workgroup Technologies, Inc. in Hampton, N.H.

Senior West Coast editor Jean S. Bozman and staff writer Christopher Lindquist contributed to this report.

Do users need it?

Since Windows 3.0's May 1990 arrival, nearly every type of application has been written for it. Although smaller firms have introduced limited offerings, the complexity of writing a database for the revamped interface has kept many of the larger firms from weighing in.

Analysts said they predict a turf battle if those introductions begin this summer as expected — particularly when Borland introduces Paradox for Windows.

Some users remained unconvinced of the need for a Windows-based database. "I don't need to sit there with a mouse and draw boxes when I'm doing queries," said Rock Blanco, vice president of IS at Garber Travel in Boston.

Thus far, Borland CEO Philippe Kahn has attempted to grab the mental high ground by demonstrating the as-yet-unshipped dBase for Windows and Paradox for Windows databases to anyone who asks.

IBM reveals partners, products for Warehouse

BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — IBM began laying the foundation last week for its 6-month-old Information Warehouse blueprint by disclosing partners and products that will support its distributed database framework.

But industry analysts and users at DB Expo '92 here said they believe it will take several more years for IBM and its business partners to top off those warehouse walls with a finished structure.

Despite the help from IBM's third-party partners, the work of lashing together the disparate pieces of the Information Warehouse will be borne largely by information systems directors, analysts said.

"There is no free lunch," said Roy Schulte, a software analyst at Gartner Group, Inc. in Stamford, Conn. "You can buy up all the technology you want, but unless you reorganize the data to work with the warehouse, it will be very difficult to get immediate

benefits from it."

Users at some of IBM's largest mainframe sites said they were not rushing to install the Information Warehouse. "It's hard to quantify an immediate payback for an investment in the warehouse technology," said Gary Weis, senior vice president of networking and technology services at Sears Technology Services, Inc. in Schaumburg, Ill. "Given the current focus in our business this year and next year, you tend not to worry about benefits that will come 10 years down the road."

"I don't think the Information Warehouse has a direct impact on us," agreed Dan Chorney, chief database administrator at Chevron Canada Ltd. in Vancouver, British Columbia.

Critical to IBM's plan

Disclosed last September, Information Warehouse is a set of products and facilities for accessing and managing diverse data across IBM and non-IBM systems in a common manner. The framework is key to IBM's push

to keep its mainframes central to evolving distributed database management schemes offered by Oracle Corp., Sybase, Inc. and other relational database management system vendors.

"We're not building databases to be islands anymore," said Juan Dash, manager of strategy and technology for IBM's Enterprise Database Solutions Group. "We have to build bridges between them. Interoperability is the heart and soul of the whole thing."

With interoperability in mind, IBM's moves to build up the Information Warehouse include the following events:

- This week, IBM starts to ship Version 2.3 of its DB2 database, which for the first time supports a "remote unit of work." IBM's remote unit of work seamlessly links the IBM core RDBMSs — DB2, the OS/400 database, SQL/DS and OS/2's Database Manager — so that a user's request to Database Manager will be passed along to DB2.
- IBM Alliance partner Information Builders, Inc. is extending its Enterprise Data Access/SQL client/server software to support IBM's remote unit of work and "remote request" capabilities.
- Twelve additional vendors disclosed support for the ware-

house's Distributed Relational Database Architecture (DRDA) program with third-party database products. Among the new DRDA partners are Cincom Systems, Inc., Sterling Software, Inc., DataEase International, Inc. and XDB Systems, Inc. They join nine early DRDA supporters.

Third-party contributions aside, Colin White, a principal at Database Associates in San Jose, Calif., said it will be two to three years before a wide range of

products fully support the Information Warehouse. At that point, White predicted, "The warehouse will give people dynamic access to places where the data resides."

However, all this functionality will come at a high cost, predicted Herb Edelstein, a principal at Euclid Associates in Potomac, Md. "The price may be stratospheric. If you've got a lot of platforms that you're trying to connect, EDA/SQL could be a very expensive solution."

First brick laid

The first chip off the Information Warehouse block appears to be IBM's Application System Version 3.0. The OS/2-based system features an icon-based environment that allows users to glue together database-query applications without IS help.

AS Version 3.0 "allows you to take raw data and make it into useful information," said Michael Kiyosaki, manager of enterprise data programming systems at IBM's Somers, N.Y., applications software center.

AS users should benefit from new features in OS/2 2.0, which is set to ship tomorrow, IBM said (see story page 1).

"With [Distributed Database Connection Services], you can precompile your query on the workstation, bypass CICS and [navigate] right into the DB2 kernel," said Jack O'Reilly, OS/2 Extended Services program administrator at IBM's Austin, Texas, desktop computing facility.

JEAN S. BOZMAN

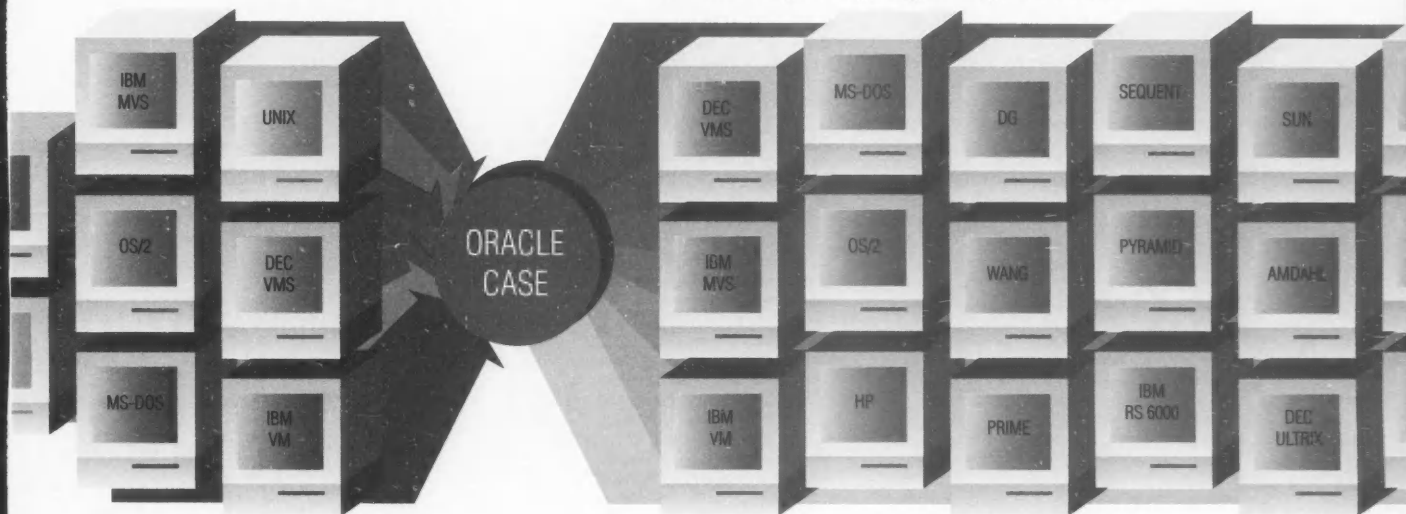
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IBM sets course for APPN

Support for mainframe tools seen as crucial to winning over SNA devotees

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM got a warm hand from loyal Systems Network Architecture (SNA) fans last week when it finally laid out plans for moving hierarchical SNA applications and mainframes to the "SNA of the future" — Advanced Peer-to-Peer Networking (APPN).

More problematic is how users will respond to IBM's proposed networking blueprint for the 21st century, which will attempt to position APPN as the underlying architecture for "allowing [multivendor] application and network protocol interoperability and interchangeability" across an enterprise-wide Distributed Computing Environment, according to Ellen Hancock, general manager of IBM's Network Systems Division.

IBM will have a hard time persuading users to adopt APPN as their primary LAN-to-LAN

connection when they can simply purchase routers that support all of their favorite local-area network protocols in native form, said David Passmore, a partner at Ernst & Young.

On the other hand, IBM's introduction of APPN support for mainframe applications is a crucial one, Passmore said. The majority of Fortune 1,000 IBM customers will not take APPN seriously as long as it is limited to IBM Application System/400s and OS/2 servers, "with no relevance to the glass house," he added.



IBM's Hancock: APPN is the future

APPN currently consists of networking, routing and directory functions that allow network nodes to automatically keep track of each other's attached resources. This in turn allows client stations to transparently access devices, applications and other resources anywhere on a peer-to-peer SNA network.

Last week, IBM addressed two long-standing gaps in the

APPN platform: the lack of IBM mainframe support and the lack of viable — that is, non-memory-intensive — access to APPN for DOS and Microsoft Corp. Windows clients. The mainframe version of APPN has no shipment date as yet. Dates for the DOS and Windows portion have been set (see story below).

IBM also attempted to bolster APPN's credibility as an "open" network protocol in that Network Equipment Technologies, Inc., Novell, Inc., 3Com Corp. and Systems Strategies, Inc. are all working to implement APPN network node specifications on their respective network products. Other vendors will be able to license an APPN network node developer's kit in first-quarter 1993, IBM said.

However, even future third-party supporters of APPN cast doubts on Hancock's portrayal of the platform as users' "best bet for the networking future."

Novell, for example, is still evaluating exactly which chunks of APPN users want to see on their NetWare servers, according to Novell Vice President Gerry Machi. Nor is Novell in any hurry, given that "APPN is now prevalent in a very small percentage of SNA sites," he added. However, roughly 75% of all NetWare shops also have IBM mainframes.

A year or so away

While most major router vendors have indicated that they will implement APPN network node, a Cisco Systems, Inc. spokesman said his company sees APPN as just one more LAN transport protocol to support — eventually. "We see APPN growing in the SNA market, starting in 1993 or 1994," Machi said.

IBM's announcement of VTAM Version 4 will allow existing 3270 terminal-to-host applications to run unchanged over an APPN link, a key first step in migrating from hierarchical SNA to APPN, Passmore said.

Banc One Corp. needs VTAM V.4 in order to begin the testing and design phase of a planned migration to a client/server environment based on peer-to-peer SNA, according to Terry Lowder, a vice president at the Columbus, Ohio, firm's Information Systems Division.

Some users may hold off on VTAM V.4 and wait for a fuller implementation of APPN functions — particularly since going from traditional SNA to APPN involves "a tremendous learning curve" on the part of IS, Passmore said. The main advantage offered by this first mainframe APPN release is that, in combination with an unannounced but expected APPN-compliant Net-

Big Blueprint

IBM's networking "blueprint" unveiled last week positions APPN as the glue that will integrate a range of networking environments — eventually. IBM was particularly vague when it came to providing time frames and the details on how support will be provided.

The game plan for APPN calls for the following developments to be released during the next three to five years:

- The ability to route a variety of popular LAN protocols over APPN backbones. IBM has already released a product to carry NetBIOS over APPN; Transmission Control Protocol/Internet Protocol (TCP/IP) and Novell's IPX are likely to be next, according to the company.
- Common application programming interfaces that will allow applications to be ported across the above-mentioned transport protocols as well as SNA.
- Support of the Open Software Foundation's Distributed Computing Environment, including remote procedure calls.
- A common set of distributed services, including directory, security and recovery.
- Support of a number of standard applications such as Open Systems Interconnect File Transfer and Access Method, the X.400 electronic-mail standard, TCP/IP Telnet and File Transfer Protocol.
- APPN+, which will route packets over asynchronous transfer mode networks at speeds of between 1.5M and 45M bit/sec. Time frame: 1993-1994.
- Gigabit APPN, an even faster routing technology slated for the 1994-1995 time frame.

ELISABETH HORWITT

work Control Program, it will eliminate some of the IS gruntwork of generating path tables.

A data processing specialist at a Missouri government agency said his group could use VTAM V.4 as a way to extend its current AS/400 APPN network to include hosts. Currently, mainframe front ends can pass along APPN transmissions to AS/400-

or OS/2-based APPN nodes but not to the hosts, he added.

For Bell Canada, a key part of IBM's introduction was the less memory-intensive LU6.2 software for DOS and Windows. The carrier has been evaluating third-party LU6.2 products as a way to link DOS and Windows clients as well as Digital Equipment Corp. VAXs to IBM hosts, a spokesman said.

Peer perspective

Much of IBM's networking announcements last week concentrated on expanding APPN support for the vendor's own computing and networking platforms.

Perhaps the most crucial introduction was ACF/VTAM Version 4, which promises to enable IBM MVS/ESA mainframes to act as APPN network nodes.

No delivery date or pricing was available.

Another missing piece of VTAM V.4, which IBM plans to remedy within two years, is the ability to route existing 3270 applications over a multinode APPN network, according to IBM spokesman Rick McGee. Right now, 3270 devices can access hosts only over a direct APPN link, with no network nodes in between, he added.

Other key APPN announcements included the following:

- Network Services/DOS, which is said to allow DOS and Windows to access APPN resources via LU6.2 — without using up all of their main memory in the process. Slated for August delivery, it is priced at \$195.
- NetView Version 2 will be enhanced so it can collect network alerts, topology and accounting data from APPN devices via the Open Systems Interconnect X.700 Common Management Information Protocol. The first APPN system to be managed, at an undisclosed date, will be OS/2.
- IBM's 6611 Network Processor is scheduled to support APPN network node by the first quarter of 1993. This will allow the router to interact with other APPN network nodes to dynamically find the optimal path to network resources and keep track of what is on the APPN network.
- The 3174 Establishment Controller will be enhanced to support Transmission Control Protocol/Internet Protocol (TCP/IP), including Telnet terminal-to-host sessions. It ships in August.
- IBM will implement TCP/IP sockets on top of SNA, allowing applications that support the programming interface to run over APPN. Availability is expected in mid-1993.
- IBM also made a statement of direction to implement APPN on AIX Version 3.2 for the IBM RISC System/6000.

Lotus set to unveil pen-based versions of Notes, CC:Mail

BY JAMES DALY
CW STAFF

CAMBRIDGE, Mass. — Add Lotus Development Corp. to the list of companies that will be entering the embryonic pen-based computer market at Comdex/Spring '92 next week in Chicago.

Although specifics remain hazy, the software developer said it plans to release pen-based versions of its Notes and CC:Mail communications applications by the end of the year. Soon thereafter, it will also take its existing suite of desktop Windows applications — Freelance presentation graphics, AmiPro word processor and the 1-2-3 spreadsheet — and tailor those to Microsoft Corp.'s Windows for Pen Computing platform.

Lotus officials said they believe that applications interaction is the key to widespread acceptance of pen-based products. "The pen is only useful when the information it generates is avail-

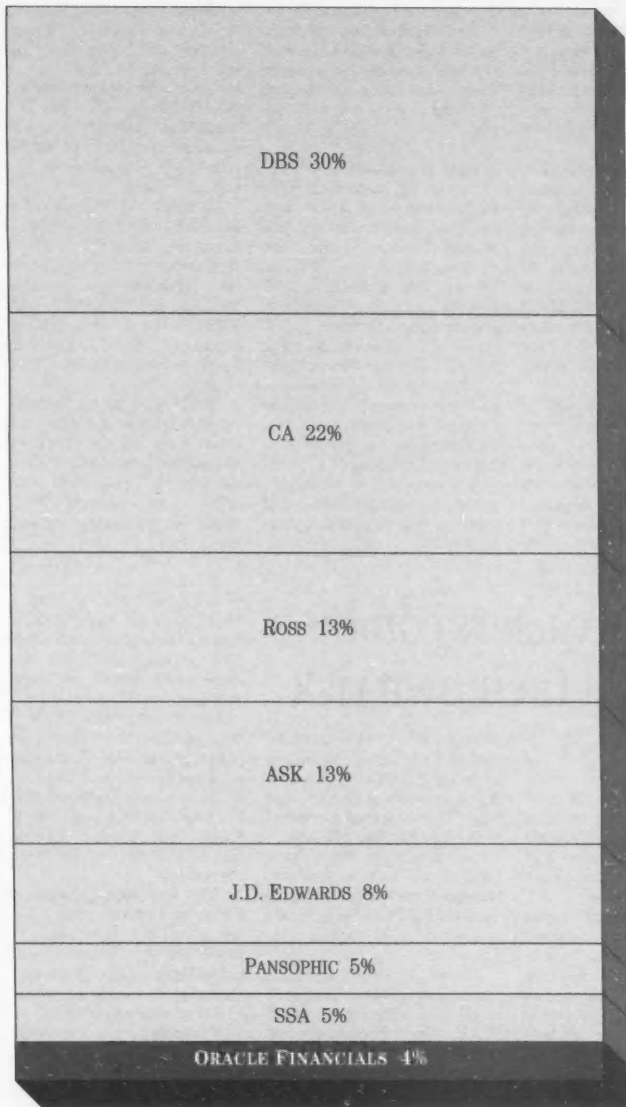
able on the local-area network," said David P. Reed, chief scientist at Lotus.

The upcoming Lotus applications will also rely on the recently announced Vendor-Independent Messaging interface, an open software specification designed to tell applications how to access mail directories, send messages and store mail.

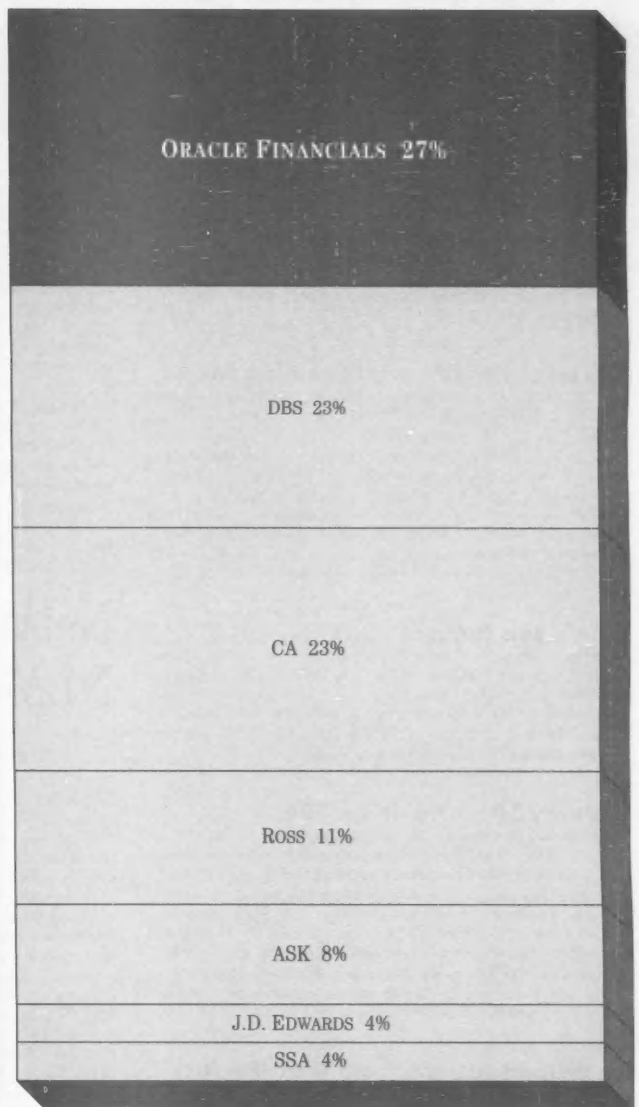
According to Reed, Lotus' pen-based products will combine both handwriting recognition and ink capture technologies.

According to analysts, the potentially explosive pen-based computer market is likely to remain grounded until at least the middle of the year, its lift-off hampered by a lack of hardware and delays in getting out the two primary pen-based operating system environments: Microsoft's Windows for Pen Computing platform, which arrived as part of Windows 3.1 two weeks ago, and Go Corp.'s Penpoint, which is scheduled to arrive April 16.

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NEWS SHORTS

Weyerhaeuser names CIO

Clifford Hall was named vice president of information technology at Weyerhaeuser Co., replacing Vice President of Information Systems Susan Mersereau. Mersereau was named vice president of quality, internal services and aviation, a corporate office position dealing with functions outside IS. Hall was most recently vice president and CIO at Manville Corp. and was previously CIO at U.S. Sprint Communications Co.

Pact targets consumers

Apple Computer, Inc. and Sharp Corp. last week entered a long-term partnership to develop personal digital assistant information devices for the consumer market, a category the companies said would bridge the gap between the personal computer and the consumer electronics market. Apple said it has licensed software for controlling such devices to Sharp. The companies said the first product launch will be slated for sometime in early 1993.

Telecom multimedia coalition forms

IBM, Pacific Bell and Northern Telecom, Inc. plan to mesh some of their products into a testbed for multimedia applications. Initially, the vendors plan to research the feasibility of a desktop multimedia communications system that would support concurrent videoconferencing and file sharing. The underlying technology is expected to include a Bellcore broadband network for multimedia applications, Northern Telecom's DMS 100 Supernode switch and IBM's Person-to-Person/2 desktop conferencing system. A tentative second phase would research new network capabilities for multimedia.

He'll see them in court

Lotus Development Corp. and Borland International, Inc. both got their noses tweaked last week in their ongoing copyright lawsuit. Judge Robert Keaton of the U.S. District Court in Boston denied motions for summary judgment from both firms and directed them to appear in court on April 17. The companies have until April 10 to submit new motions.

It's a 386 — no, it's a 486!

Cyrix Corp. unveiled its long-rumored Intel Corp. 80386 clone, with a slight twist: The 16-bit processor has 486 in its name. Cyrix's Cx486SLC claims pin-compatibility with Intel's 80386SX, while giving 2½ times the performance, according to the Landmark benchmark used by Cyrix. It outperforms IBM's new SLC chip by 1.7 times, according to the same test. Cyrix is targeting OEMs concerned about the IBM-specific SLC. The 3.3V chip could also work well in the portable environment. Cyrix said it will ship sample quantities in April and expects to sell in volume later in the second quarter.

Peterson resigns from WordPerfect

WordPerfect Corp. last week reshuffled its directorial deck, announcing a reorganization of its board of directors. The big change is the departure of longtime executive Andre "Pete" Peterson, who is resigning both his position on the board and his executive vice president slot to pursue other interests. Joining the board are Duff Thompson, John Lewis and David Moon.

Short takes

Micrografx, Inc. announced a three-for-two stock split in the form of a 50% stock dividend. . . . **IBM** plans to resell some **United Systems and Software, Inc. (USSI)** products for its Application System/400 line, including USSI's Life Insurance Administration System, Life and Health Administration System and Group Health Administration System. . . . **Kendall Square Research**, a maker of parallel computer systems, has commenced a public offering of 4 million shares of its common stock at \$11 per share. . . . **Convex Computer Corp.** officials issued a statement saying they are unaware of any corporate development behind the frenetic movement of Convex stock last week.

More news shorts on page 20

Novell to ease net messaging

NetWare Global Messaging could eliminate need for messaging servers

BY JIM NASH
CW STAFF

SALT LAKE CITY — Optimism greeted the news last week that Novell, Inc. will market a series of NetWare Loadable Modules capable of transmitting messages under any one of several messaging protocols.

The Provo, Utah-based networking company introduced NetWare Global Messaging, a software product line for Novell's NetWare Version 3.11 server operating system at the Novell developers' conference held here last week [CW, March 23]. It could eventually make messaging servers sold by numerous other vendors redundant.

Several developers and at least one network manager said Novell's announcement bodes well for the messaging industry, which is currently beset with confusing and controversial standards. But other users said they were skeptical of a signifi-

cant need for such sophisticated application functions on Novell's typically small networks.

In May, according to Kanwal Rekhi, a vice president at Novell, the firm plans to ship a central module containing its Message Handling System transport engine.

A host of protocols

At an as-yet-unspecified date, modules supporting X.400, Simple Mail Transfer Protocol and System Network Architecture Distribution Services will be shipped. The modules will all support a string of application programming interfaces, including NetWare Standard Message Format, X.APIA, Vendor-Independent Messaging, Microsoft Corp.'s Messaging Application Programming Interface and Apple Computer, Inc.'s Open Collaborative Environment.

The software can be used to transport messages among end users as well as among applications in large, heterogeneous en-

vironments. It can also be used simply to route messages among systems.

The routing capability is attractive, said Nancy Raley, director of office information systems at CalFarm Insurance Co. in Sacramento, Calif. "We don't need to integrate a heck of a lot of different systems, just our Microsoft MS Mail and Sysm systems."

CalFarm recently installed MS Mail and maintains Sysm, a messaging package from H and W Computer Systems, Inc. in Boise, Idaho. Sysm provides mail services for CalFarm's IBM 3084. "If we could standardize on just one router — especially NetWare — we'd like that," Raley said.

Novell is calling the software "global" because it will have the ability to automatically download messaging directories from mainframes, for example, then update and replicate them among all complying message applications.

NetWare users combine NLMs at their own risk

BY JOANIE M. WEXLER
CW STAFF

Novell, Inc. NetWare 3.X users agree they must rigidly test their NetWare Loadable Modules (NLM) as a package before running them alongside one another in production networks.

Testing is particularly important for users planning to leverage Novell's unfolding "universal server" strategy for reducing network hardware investments [CW, March 23]. The reason is that as more functions get bundled into NetWare servers via the software-based NLMs, the likelihood increases that varying combinations of NLMs will have a bad reaction to one another — similar to a mixture of incompatible prescription drugs, Novell users and dealers said.

For example, "If an NLM is not well-behaved, it can take over the server and hog all the processing cycles," said Bruce Almich, technical manager of data and telecommunications at the U.S. Environmental Protection Agency's (EPA) computing branch, a large Novell shop in Research Triangle Park, N.C.

The EPA is currently looking to bring up three third-party NLMs. "We will test them together in the lab, then pilot them with a small community of users before actually installing them," Almich said.

Other mixed-NLM problems could include servers locking up or an NLM's memory overwriting the memory of another, said Marc Trachtenberg, director of technology at NetLAN, Inc., a Novell dealer in New York. While Novell certifies its own and many third-party NLMs, the vendor cannot test the hundreds of possible NLM combinations, Trachtenberg said.

"We've seen absolute nightmares [with NLM compatibility], specifically with the Arcserve NLM," said Paul Heery, director of technical services at HEL, Inc., a Novell dealer in Wayne, Pa. Arcserve is a Novell-certified tape backup NLM from Cheyenne Software, Inc. in Roslyn, N.Y. "We've run into instances where the servers would shut down, so we've installed separate machines as Arcserve tape servers so as not to affect the production file server."

The full scope

John Edwards, vice president of marketing at Novell's NetWare Systems Group, said, "We have heard of no significant problems" with modules conflicting with each other. However, he said, such conflicts are not beyond the realm of possibility. "But you've got to look at the overall system. Is NetWare as a whole stable? It is."

Still, John Livengood, net-

work specialist at Easel Corp., a Novell shop and software developer in Burlington, Mass., said, "We probably won't put very many NLMs on one server because of these issues."

Despite the potential stability trade-offs, however, Livengood is looking into network management and virus protection NLMs and is considering software from Nu-Mega Technologies, Inc. in Nashua, N.H., which is said to insulate NLM memory from being overwritten.

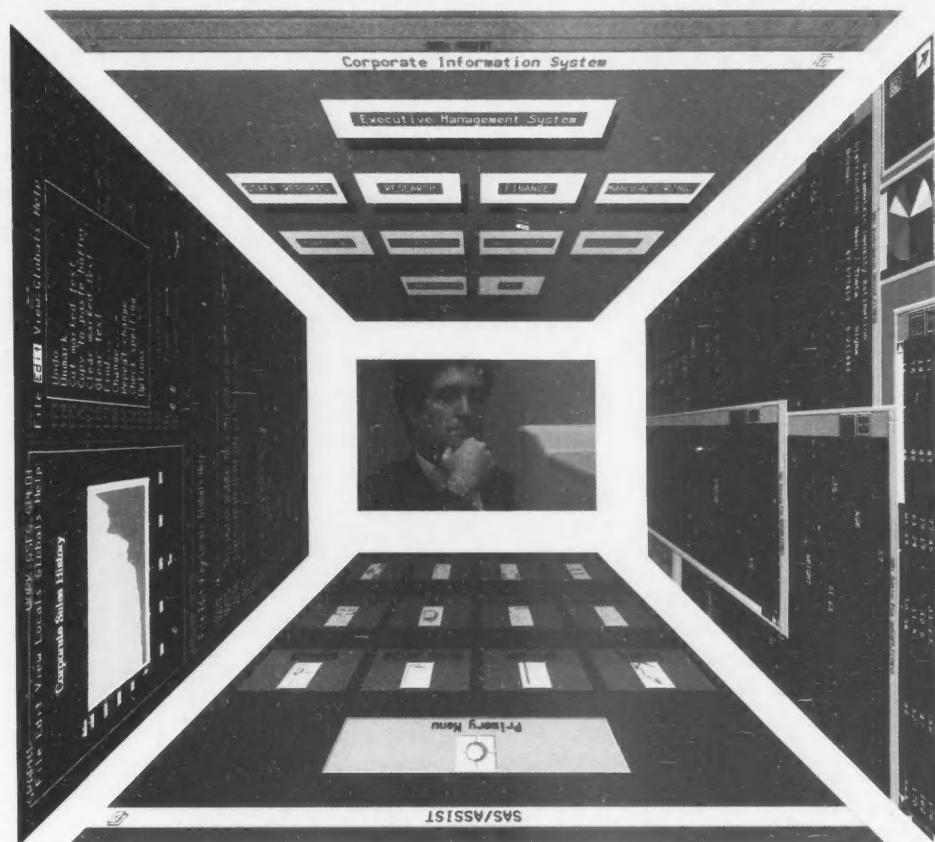
Tom Henderson, president of Corporate Networks, Inc., a Novell dealer in Indianapolis, recommended that packages such as Nu-Mega's "be strongly considered by users wanting to use NLMs uncertified by Novell" or with NLMs that use large amounts of memory and system resources.

Henderson noted, however, that the memory insulation slows NetWare performance.

Heery said some of his customers experienced server freezes with Novell's own database-handling Btrieve NLM running with third-party NLMs, but that other customers run 25 NLMs on one machine, "and it's perfectly stable."

The potential of NLM incompatibilities is not deterring some users from NetWare-centricity. Mike Smith, operations officer at The Boston Co., a Boston-based bank, said, "As long as NLMs are tested and stable and 100% approved by Novell, they're good for reducing hardware."

West Coast correspondent Jim Nash contributed to this report.



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United takes the distributed approach

CONTINUED FROM PAGE 1

"Our users are noticing that in order to take full advantage of this technology, they are having to rethink business processes," Wetli said, adding that United's methods and standards group is already working on these issues.

In the coming months, United passengers should reach their planes faster, thanks to several client/server applications built by United's in-house IS staff in collaboration with Covia Partnership. Covia is the Rosemont, Ill., developer of United's Apollo customer reservation system (CRS), which is 50% owned by the \$11 billion airline. For example, one of

the most recent and visible applications involves magnetic swipe scanners at the United ticketing and gate agent counters that were deployed last month.

Automated printing

Instead of writing information by hand on paper forms, United personnel will run the traveler's ABT coupon (a ticket with a magnetic strip on the back) to complete a variety of transactions, from printing a luggage tag to filling out a form for a child traveling without a parent.

The same scanner, provided by Magtek in Carson, Calif., can read United

Mileage Plus cards, credit cards and United employee security passes. Time and motion studies have found this single application to reduce the time it takes to process a passenger by a whopping 30%.

Other systems involve application-to-application communications, bypassing not only United's mainframes but also United's personnel.

In addition to being able to access the Apollo CRS, United personnel can get at data residing on three other major mainframe applications: Unimatic, a Unisys Corp. system for airline operations; Cosmo, a maintenance system; and an

IBM MVS administrative system.

This information, relayed over a radio data link, updates the SQL Server database server at the user's terminal, which in turn controls the arrival/departure monitors throughout the building.

United began its exploration of client/server in 1987 with a limited installation at O'Hare Airport. At the time, United used IBM Personal System/2 Model 50s for the workstations and PS/2 Model 60s as the servers, both running DOS. The application was limited to operational systems such as baggage handling and control of the monitors inside the airport terminals that advise travelers of arrivals and departures.

But emboldened by the success of the O'Hare system, United conducted a two-year prototype in 1988 in its smaller airport terminal at Philadelphia International Airport. With 80 workstations, it ran a larger portion of the airline's airport activities, including passenger ticketing and

IN THE COMING months, United passengers should reach their planes faster, thanks to several client/server applications built by United's in-house IS staff in collaboration with Covia Partnership.

check-in — what United officials call "public-contact" applications.

United has now upgraded its workstations to Philips Telecommunications N.V. diskless personal computers running Windows 3.0 and PS/2 Model 95 servers running OS/2. Microsoft's LAN Manager was used to tie together the IBM Token Ring local-area networks inside the airport terminal; the servers acted as gateways to a variety of hosts over an IBM Systems Network Architecture wide-area network.

Besides being installed at the O'Hare and Philadelphia airports, the client/server architecture has also been installed at United counters in Washington, D.C., Orlando, Fla., and London. Installation will be completed this summer in San Francisco, Los Angeles, Tokyo and Denver.

Wetli said United has considered moving data off the Covia mainframe in Denver that runs the massive Apollo CRS and distributing it to the servers throughout its WAN. However, he said that downloading passenger records from that host to the individual airport servers would bring with it complex storage, WAN and data integrity issues. "Understand, passengers for flights out of any one airport are booked from all over the world," he explained.

About 50 people in United's 1,300-person IS staff are allocated to client/server development, Karmazin said, adding that the carrier did not use outside consultants to build the network infrastructure or software applications.

"We felt we had gained considerable experience with the technology we and Covia layed out at O'Hare . . . and didn't feel we had a lot to gain from an outsider," Karmazin said. About 25 Covia employees are also dedicated to working on client/server systems for United.

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Sky-high goals nearly met by OS/2 2.0

BY CHRISTOPHER LINDQUIST
CW STAFF

When IBM set its goals for OS/2 2.0, it set them pretty high. It was to be a better OS/2 than OS/2, a better DOS than DOS and a better Windows than Windows. Lofty goals for any operating system. Now, OS/2 2.0 is here — at least it is for those who will be receiving it electronically from IBM tomorrow. Shrink-wrapped releases will not be available until late next month.

OS/2 2.0 does not quite achieve all three aims — the Windows support is good, but it is not better than Windows — but two out of three is not bad. While OS/2 2.0 has some shortcomings, it is not a product to be taken lightly.

And its memory needs are anything but light. A full installation will take some 30M bytes of disk space. And while average disk storage on systems is going up steadily, 30M bytes may be too much to ask on some lower-end systems — say a 386SX with 40M to 60M bytes of disk space, for example. To be fair, required disk space can be reduced by more than 10M bytes by choosing a minimal installation that excludes unneeded features and applications.

Main memory requirements are also high. IBM said the system will run in 4M bytes of random-access memory. And it will. But it will also put hard drives through endurance tests if more than an application or two is opened. *Computerworld's* original

test system, an IBM Personal System/2 Model 70, had 4M bytes of RAM and performance was unreasonably slow.

Speed improved dramatically after another 2M bytes of RAM

line tutorial; and that is about it.

The Workplace Shell takes some getting used to, but it is worth the effort. The user is presented with a collection of desktop "objects," including folders,

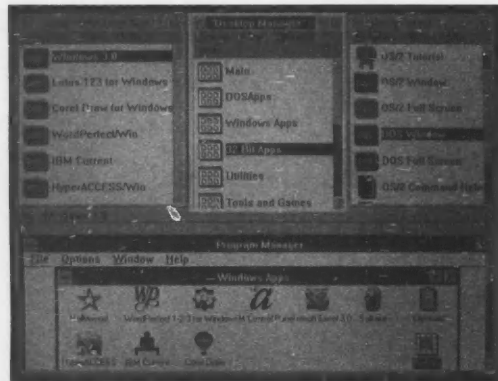
applications do pick up a bit of a jerky feel under OS/2 2.0, particularly graphics applications running in a DOS window. However, there are some definite advantages. For starters, DOS applications can be multitasked under OS/2 2.0. And the amount of control users have over each DOS session is impressive.

By calling up the DOS Settings menu, you can dynamically alter environment settings such as DOS version, memory allocation and number of available file handles.

Is it a better Windows than Windows? Yes and no. Load times and execution speeds seem generally slower, particularly in "seamless Windows" mode, with Windows and OS/2 applications running side by side. However, Windows applications are certainly usable under OS/2, and considering OS/2's flexibility with DOS applications and its ability to run OS/2 programs, a strong argument could be made for the "better Windows than Windows" claim.

If a certain Windows application is primary to your needs, you will probably want to stick with Windows exclusively, particularly with the speed and reliability enhancements of Windows 3.1.

OS/2 2.0 is not for everyone. Its size alone dictates that. But power users, departments with mission-critical applications — in fact, anyone interested in a robust, preemptive multitasking, multithreaded environment — should give OS/2 serious consideration.



OS/2 2.0, touted as 'better Windows than Windows,' runs Windows 3.0 in standard mode on this beta-test screen

were installed, but 6M bytes is about the minimum anyone will want to use. That may mean some hardware upgrades, but the speed improvements will make the cost worth consideration.

The first thing you will notice about OS/2 2.0, naturally, is the installation procedure. This alone makes OS/2 2.0 a better OS/2 because IBM fulfilled one of its key promises: to make installation easier. Installers will be asked if they want to migrate DOS, Windows or OS/2 applications; format the disk; select a file access system; access the on-

applications and drive icons. No menus appear anywhere on the screen until the right mouse button is clicked on either an object or the desktop.

Right-clicking for menus is slick. You no longer need to deal with long menu bars cluttering the screen. Menus appear on command and only include relevant choices. Someone should have thought of this sooner.

Better to an extent

OS/2 2.0 is a better DOS than DOS, to a point. It is slightly slower than running a DOS application under straight DOS. Appli-

cations to a PC to the forefront of purchasing decisions.

"Pricing is going to be the determining factor for me," said Anthony Best, data processing procurement analyst for the state of Mississippi, adding that the IBM bids that he received within the last two weeks have just not been competitive enough.

"Even if IBM came up with a great support strategy, if their prices are higher and Dell's support is fine, it's not worth it to me to switch," said John Biglin, PC coordinator at General Waterworks Management and Service Co. in King of Prussia, Pa. Biglin currently buys Dells.

Carberry promises more change in this regard. "There is a set of customers whose primary value is price, and yes, we'll address that customer," he said.

Name alone won't restore customer confidence

CONTINUED FROM PAGE 1

a rest," said Robert Carberry, IBM's assistant general manager of technology for the personal systems line of business. "We're still in midweek — maybe Thursday or Friday."

IBM's strategy, Carberry said, is to get more products out faster and cheaper. He said it will also change its distribution to meet customer needs, even if it means putting "a semitruck filled with PCs in Times Square."

Some IBM users contacted last week have indeed found a more responsive company. "I've used IBM hardware since 1955 and have been dealing with them since 1982 in the PC area, and never before have they tried to address our problems the way they have" since last fall, said J. Briscoe Stephens, data and IS manager at NASA's Earth Sci-

ence and Applications Division in Huntsville, Ala.

Ben L. Berry, manager of computer services at Hughes Aircraft Co. in Los Angeles, said that although IBM is improving, it still has a lot of work to do to penetrate beyond the corporate offices at Hughes.

"They're going to have to get their reps out more to end-user computer managers at Hughes, demo products and show them how buying IBM makes better business sense not only in the short term but in the long run as well," Berry said.

Federal Reserve

Bank's Tignanello said dealing with IBM "left a bad taste in my mouth" when Personal System/2 Model 60s developed problems, and IBM refused to acknowledge the problems existed. His shop has since switched to Compaq Computer Corp. PCs.

The price wars that have raged in the hardware industry for the last 18 months have pushed the dollar amount at-

Full frontal assault	
With its five-part PC initiative, IBM is aiming at competitors across the board	
New IBM products	Targeted competition
SLC chip	Intense clone maker price pressure
HelpWare	Recent support initiatives from Dell and Compaq
Notebook PCs	Compaq, Toshiba and AST are burning up the notebook market
OS/2 2.0	Windows, desktop Unix
High-end servers ...	Compaq's competitively priced Systempro LT has achieved some success

CW Chart: Michael Siggins

Unorthodox approaches

CONTINUED FROM PAGE 1

company will launch next month. Key to IBM's plan is pricing. IBM will offer OS/2 2.0 at cut-rate prices — as low as \$49 — sources close to the company said last week. Company officials declined to reveal specific pricing for Version 2.0.

Another leg of the strategy encourages IBM employees to preach the OS/2 gospel. In fact, the company intends to launch its first companywide incentive program, which will reward employees with OS/2 pins, software or cash for any OS/2 business they bring in.

None of this will be effective unless IBM has product to sell. IBM officials said last week that the company is on schedule to electronically download 2.0 to Early Experience Program and Limited Availability Program customers tomorrow, which marks its self-imposed deadline.

Meanwhile, manufacturing of 2.0 disks is slated to begin today, and shrink-wrapped packages should be on retail shelves by the third week of April, said Lucy Baney, Personal Systems director of programming systems market development.

Breaks on Windows

Industry sources said IBM will offer price breaks targeted at Microsoft Corp.'s Windows and DOS users as well as first-time users. Windows users can expect the best deal (about \$49), while DOS and first-time users will be charged slightly higher prices. However, both prices will be under \$100, sources said.

IBM's suggested retail price for OS/2 2.0 is \$195. Microsoft is offering a Windows 3.1 upgrade to Windows 3.0 users for \$49.99 until June 1. It has not released its suggested retail price for new users of 3.1, but it will be comparable to the 3.0 price of \$149.


Baney said there are no current plans to offer OS/2 giveaways other than to the installed base of OS/2 1.3 users, who have been expecting free upgrades.

While consumers will have a few weeks to wait for 2.0, some corporate customers said they are expecting to receive an electronic version tomorrow.

"They are adamant that something will be delivered to someone by deadline," said Wayne Robinson, manager of technical services at Prudential Investment Corp.

While IBM would not talk about prices last week, it did confirm that it will sell OS/2 2.0 through mail order.

Baney said the company will launch an extensive advertising campaign when Version 2.0 is finally on retail shelves.



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Vendors harvest a rich crop of notebook products

BY MICHAEL FITZGERALD
CW STAFF

The North may be covered with a late snow, but the notebook market is busting out like high noon in June. Vendors ranging from IBM to Beaver Computer Corp. announced products last week, while others began shipping previously announced machines.

The new systems provide more bang for the buck than do existing machines, and at least one analyst said the market will continue to see vicious price cutting.

"Vendors with SX machines stockpiled the SLs coming, and they're dropping prices. Now the color and 486 products are coming to market, so people with SLs are saying, 'We don't want to get stuck with these,' so they'll drop in price, too," said Andrew M. Seybold, editor and publisher of "The Outlook on Professional Computing," a newsletter based in Boulder Creek, Calif.

For instance, IBM ushered in what might be a new era, with

notebooks priced to sell as low as \$1,800 on the street [CW, March 23].

"IBM has put a stake in the ground, which is going to make it much more difficult for other vendors to come in at the 15% to 20% below it like they used to," said Stephen Widen, an analyst at Workgroup Technologies, Inc. in Hampton, N.H. Widen said he sees lower prices and slim profit margins coming.

"I think it's a question that [vendors] might not be making any money on these products, but certainly you don't want to lose visibility," Widen said.

Dell Computer Corp. may have fired an early salvo with its NL25 notebook, based on Intel Corp.'s 25-MHz 80386SL power management processor and

Notable portables

The following companies unveiled notable systems last week:

Beaver Computer

Model: Avanti 025.
CPU: 25-MHz AM386SXL.
Main memory: 2M bytes of RAM.
Communications: 2,400/9.6K bit/sec. fax/data modem standard.
Mass storage: 60M-, 80M- or 120M-byte hard drive.
Bundled software: Windows 3.0, Winfax 2.0, Terminal Plus.
Weight: 6.6 pounds.
Price: \$2,500.
Availability: Now.

Dell Computer

Model: NL25
CPU: 25-MHz Intel 386SL.
Main memory: 2M bytes of RAM.
Mass storage: 60M- or 80M-byte hard drive.
Weight: 6.3 pounds.
Price: \$1,999.
Availability: April.

priced at \$1,999.

Leading Edge Products, Inc. meanwhile announced a passive-matrix color notebook that will probably sell for under \$3,000, challenging the upper pricing

Leading Edge Products

Model: N3/SL25.
CPU: 25-MHz Intel 386SL.
Main memory: 2M bytes of RAM.
Mass storage: 60M-byte hard drive.
Bundled software: Windows 3.1, Works for Windows.
Weight: 6.9 pounds.
Base price: \$2,699.
Availability: April.

Model: N3/SL25C (passive matrix).
CPU: 25-MHz Intel 386SL.
Main memory: 2M bytes of RAM.
Mass storage: 60M- or 80M-byte hard drive.
Bundled software: Windows 3.1, Works for Windows.
Weight: 6.9 pounds.
Price: \$3,799.
Availability: April.

CW Chart: Janell Genovese

"None of the technology is brilliant, but overall it's one of the nicest little notebook computers," said Steve Lair, an analyst at Dataquest, Inc. "They have a real understanding of who uses portable computers."

Several other vendors that announced products last fall said they are now shipping notebooks, including Toshiba America Information Systems, Inc. and Advanced Logic Research, Inc. (ALR). Toshiba began shipping its T3300 and T4400SX notebooks. The T3300 uses Intel's 25-MHz 386SL chip, while the T4400SX uses the 486SX. ALR

reannounced its line of upgradable notebooks, now called the Ranger series, due to ship in mid-April.

An active-matrix color version of the T4400SX, announced in Europe in mid-March, is expected to be introduced here April 6. Zenith Data Systems is expected to follow the European debut of a color Mastersport SL notebook by announcing the U.S. availability of the product here April 6.

Microsoft gains points with Excel 4.0

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — The Windows spreadsheet wars have not even begun in earnest, as Borland International, Inc.'s Quattro for Windows has yet to be released, but Microsoft Corp. lobbed an early volley onto the court with last week's announcement of Excel 4.0.

While spreadsheet makers have long been barraging each other with ever-lengthening lists of features, Microsoft has modified its tack with Excel 4.0 and is concentrating on ease of use.

The company has looked to take "existing features and make them more accessible to the average spreadsheet user," rather than adding more features, said Bill Johnson, product

manager for Excel.

Making the spreadsheet easier for average users struck a chord with at least one Excel customer. "That's important to us," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co. in San Francisco, an Excel 4.0 beta-test site. "We certainly will migrate" to Excel 4.0."

Call to order

According to Microsoft, Excel 4.0 development attempted to address the following four areas of usability:

- Basic Usage, with Autofill and Drag and Drop features, intended to aid in rapid spreadsheet creation.
- Analytical Tasks, through the use of tools such as Crosstabs, which allows users to cross-tabu-

late information quickly across several spreadsheets.

- Presentation and Printing, with enhanced chart-creation tools.

- Transition from Lotus Development Corp.'s 1-2-3, with a macro interpreter allowing more than 90% of Lotus macros to be run unmodified under Excel.

"It must read Lotus macros," said Jay McCullough, a systems analyst at Rohm and Haas Co. in Philadelphia. McCullough is involved in deciding whether the company will use Excel or Lotus 1-2-3 for Windows. He indicated that the firm is leaning toward Excel, but the final decision will rest on how well the product works with his current Lotus macros.

Other ease-of-use features in Excel 4.0 include the following:

- Data can be moved using a drag and drop technique instead of cutting and pasting.
- Autofill allows user to enter one or two members of a series, such as "January, February" or "2, 4"; Excel will extend the series to a user-defined number of places.
- The Scenario Manager allows users to group sets of "what-if" scenarios into a single file for easier handling.

Excel 4.0 is scheduled to be available in mid-April. The Apple Computer, Inc.'s Macintosh version is slated due for release in mid-May. Both products will carry a list price of \$495. Excel for the Macintosh will support the System 7.0 operating system.

Extended help on the way for Windows 3.1 customers

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — In an effort to stem what it expects will be a tide of user support requests for Windows 3.1, Microsoft Corp. recently appointed a vice president of support and unwrapped a series of Help programs designed to assist Windows 3.1 users.

"We have excess capacity for Windows 3.1 [support] right now," said newly promoted Vice President of Support Patty Stonesifer.

Microsoft expects the number of Windows support calls to more than double from the current figure of 3,500 to some 8,000 after Windows 3.1 ships, she said.

Microsoft has increased the number of employees in its support division from 700 to 1,200 in the past 12 months in an attempt to increase responsiveness. In addition, a variety of other programs have been added or enhanced in Microsoft's support offerings, including the following:

- A seven-day-per-week, 24-

hour-per-day "FastTips" support line that gives users access to the Top 40 Windows 3.1 questions, culled from beta testers, and fax delivery of Windows 3.1 technical notes.

- More than 100 free Windows 3.1 technical seminars to be held across the country.

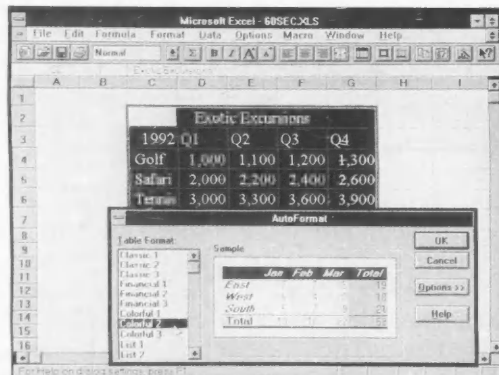
- A Windows Resource Kit manual with technical information and utilities for optimizing and troubleshooting Windows 3.1. It costs \$19.95.

- A free "Focus On Windows" newsletter, available to all registered Windows users.

- A Windows Drivers Library, available for downloading from Microsoft's own support electronic bulletin board, CompuServe or Genie or on disk from Microsoft for \$20.

- A Windows Technical Support Library, available from the Microsoft Product Support Download Service at (206) 637-9009.

Stonesifer said Microsoft has a commitment to improve its support and that other programs, including daily round-the-clock support specific to a user's site, will be available in the coming months.



Microsoft's Excel 4.0 gives more access to existing features

Cellular vendors form data alliance, plan standards

BY ELLIS BOOKER
CW STAFF

CHICAGO — Demonstrating high hopes for the potential of pervasive, wireless data services, five cellular carriers agreed last week to create standards for data carried over their existing cellular mobile networks. This move could result in nationwide services in the future.

The alliance includes the cellular units of three regional Bell holding companies — Ameritech Mobile Communications, Bell Atlantic Mobile Systems and Nynex Mobile Communications — as well as Contel Cellular, Inc. and GTE Mobilenet. Together, the five companies claim almost 2 million customers in 128 cities and 69 rural areas.

Herschel Schostek at Schostek Associates Ltd., a telecommunications economics and market research firm in Silver Spring, Md., said this and future alliances are inevitable given the fractured way the cellular market developed in the U.S.

"We're bizarrely unique in that we licensed [cellular companies] market by market instead of on a regional or nationwide basis," he said.

Regarding data applications over cellular, Schostek was skeptical. He cited his empirical studies that have consistently shown only 1% to 2% of all cellular phones sold are used for data.

"Cellular is today, and will fundamentally remain, a voice technology," he said.

A letter of intent signed by

the five cellular companies calls for the formation of a business venture "to explore and test new wireless data communications technologies, research customer needs for wireless data and then develop minimum standards."

A spokeswoman at the Amer-

itech cellular unit said compatible, standard cellular services for data will be available in 1993.

In February, the same five carriers announced plans to create a nationwide "brand identity" for cellular voice services.

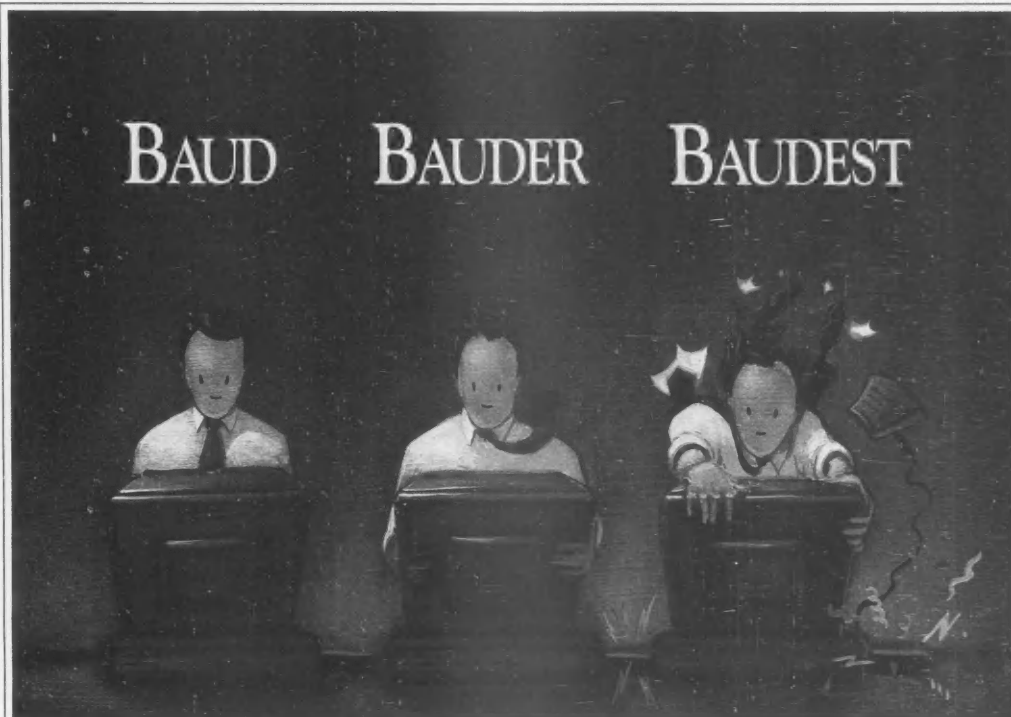
Conspicuously missing from the consortium, however, were

two of the nation's biggest cellular operators: McCaw Cellular Communications, Inc. in Kirkland, Wash., which claims about 1.5 million cellular customers nationwide, and BellSouth Cellular Corp., the cellular operation of Atlanta-based BellSouth Corp., which claims more than 1

million cellular customers.

A spokesman at McCaw said last week that the company planned to be "an active participant in the data industry" and would be making its own announcement in the near future.

A spokeswoman at the BellSouth unit said the firm did not rule out participation at this time and would look at all alternatives.



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Ardis' aim

The nation's largest provider of two-way wireless data networking last week announced plans to publish its proprietary protocol, enabling other manufacturers to build wireless modems that work with its network.

Until now, only Motorola, Inc. — which along with IBM owns Lincolnshire, Ill.-based Ardis — has produced the radio data modems that work with the nationwide Advanced Radio Data Information Services (Ardis) network. Now a 4.8K bit/sec. facility, Ardis will upgrade to 19.2K bit/sec. speeds in its major markets by year's end.

Motorola is also producing board-level Ardis modems.

Sun storage prices plummet

Cost of SPARCserver disk and memory aimed at cutting rivals' business

BY MARYFRAN JOHNSON
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems Computer Corp. (SMCC) announced price cuts last week on memory and disk drives for high-end SPARCserver 600MP machines. The cuts were part of a push to increase share in its own peripherals market.

"There is a thriving third-party business selling memory and add-on disks, and Sun is quite aggressive on pricing," said Mark Stahlman, an analyst at Alex. Brown & Sons, Inc. in New York. "Sun's memory prices now are one-half to one-third of IBM, DEC and Hewlett-Packard." He added that Sun is also highlighting how its products are increasingly price-competitive against workstation rivals as the systems get beefed up with additional memory and disk drives.

A subsidiary of the parent company Sun Microsystems, Inc., SMCC actually rolled down its disk and memory prices earli-

er this month but only announced the action last week.

Sun's 64M-byte memory option board, which once cost

1200, is now \$4,800.

"The price changes probably mean I'll do more of an upgrade than I'd planned before. I can load up the processor more," said Gene Kotack, information systems director at Brewers Retail in Toronto.

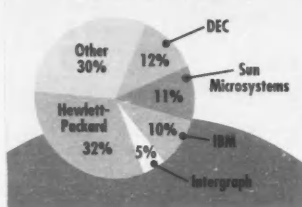
A distribution cooperative of several major Canadian brewers, Brewers Retail is upgrading three SPARCserver 470s to 670MP models and using a mix of third-party and SMCC peripherals, Kotack said.

That is just the sort of activity Sun hopes to encourage with the price reductions, according to Mike Schafir, an SMCC product manager. "The 600 server family has been widely successful for us, and we've sold more than 4,000 systems in the last four months," he said.

Over the horizon

Sun holds a respectable third place in RISC multiuser systems

Worldwide 1991 RISC market share by units consumed
Total units: 63,191



Source: Computer Intelligence/Infocorp
CW Chart: Janell Genovese

\$10,000, is now \$5,200. Prices on two 1.3G-byte drives dropped by \$1,000: The 1.3G-byte Small Computer Systems Interface drive now costs \$4,300, and the 1.3G-byte Intel-

HP stacks chips in RISC game

CONTINUED FROM PAGE 1

on Alpha into 1994," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "Meanwhile, HP will be running hard in 1993."

Last week, HP also went public with the nine-member PRO group, which is dedicated to ad-

vancing and broadening the use of PA-RISC technology.

Bell surprised analysts at the PRO luncheon held here when he whipped out a 4-sq-in. daughterboard bearing the new PA-RISC chip.

"I was so taken aback when

he just pulled it out of his pocket," said John Logan, an analyst at the Aberdeen Group in Boston. "I thought volume production of these chips was months away."

Price stays level

Users are anticipating a 50% performance boost with "no significant price increases" on the new HP systems, said Duane Elms, program manager of technical computing at General Electric Co. in Bridgeport, Conn.

"The DEC chip is a nice one, but there's nothing inherently breakthrough about Alpha," Elms added. "Frankly, the HP chip is more efficient on instructions per cycle."

Technical details published on both HP's PA-RISC 7100 chip and DEC's Alpha RISC proces-

HP coaxes Series 400 users onto upgrade path

BY MARYFRAN JOHNSON
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. is expected today to open the first upgrade path to its current line of high-performance Unix workstations, targeting an estimated 60,000 customers using older Apollo workstations.

The upgrade is for users of the Apollo Series 400 workstations — based on Motorola, Inc.'s 68000 processor — who want to move to the HP Apollo 9000 Series 700 reduced instruction set computing (RISC) workstation line, which is based on HP's Precision Architecture-RISC processor.

Priced from \$6,000 to \$8,000, a range of board upgrade kits will start appearing this summer.

Performance jolt

The initial upgrade kit will quadruple the performance of a Series 400 Model 425e by turning it into a Series 700 Model 710. Software that now runs on the Series 700 will run on the upgraded workstation without modification, according to HP officials.

In 1993, HP plans to offer similar upgrades for the Series 400 Models 400d, 400t/s and 433. It is also providing additional interoperability and migration tools to help customers whose workstations run the Apollo Domain/OS operating system to integrate HP/UX-based Series 700s into their networks.

The tools give Domain and HP/UX users the chance to cre-

ate a common user interface, windowing and editing environment, use an improved version of the Network File System and share information on an Apollo Token Ring-based local-area network through Apollo Token Ring connectivity.

Doing its darnedest

"HP is very honestly trying to work with installed base environments," said Doug Eltoft, president of InterWorks, the HP user group. Eltoft also manages a massive HP workstation network for the University of Iowa in Iowa City.

"I just ordered some 425s, and when I achieve interoperability between my Domain/OS-based units and my small number of Series 700s, I'll buy these board upgrades for the 400 series," Eltoft said.

Series 400 customers who want to extend their systems' capabilities but retain the Motorola architecture can upgrade to the 33-MHz MC68040 microprocessor, which HP is already shipping.

Also available now is the new release of Domain/OS, which complies with the Open Software Foundation's Application Environment Specifications.

"This upgrade is clearly one of the biggest issues facing HP," said Mark Stahlman, an analyst at Alex. Brown & Sons, Inc. in New York. "HP sold enormous volumes of Motorola-based Apollo workstations, and they are now being driven into the transition that Sun went through three years ago."

sor put them in roughly the same performance class, analysts said. Users, however, are watching for more than advanced chip architectures.

"The real issue is whether something is accepted, how fast it moves into the marketplace and whether third-party software vendors are writing to it," Elms noted.

Not only does HP have the advantage of several years' experience with RISC processors, but its compiler technology is also highly reputed, said Ted Krum, an analyst at D. H. Brown Associates, Inc. "DEC is not only under the gun to get its chip out, but to come out with very sophisticated compiler technology as well," he said.

Gentleman's agreement

In a deal more like a gentleman's agreement than an industry alliance, HP last week established the PRO to champion its PA-RISC technology. Joining HP are Convex Computer Corp., Oki Electric Industry Co., Hitachi Ltd., Prime Computer, Inc., Hughes Aircraft Co., Sequoia Systems, Inc., Mitsubishi Electric Corp. and Yokogawa Electric Corp. The group will trade expertise, jointly market and distribute certain products and work to increase the allure of PA-RISC. Cooperation, not competition, will be the PRO party line.

DEC memo takes sales reps to task for overspending

BY MARYFRAN JOHNSON
CW STAFF

MAYNARD, Mass. — A confidential memo that leaked from Digital Equipment Corp. last week cast a harsh and embarrassing light on free-spending sales and service representatives, who were taken to task for at least \$30 million in expense

account overspending.

The memo found its way into *The Washington Post* and was written by James A. Wallace, financial manager of DEC's U.S. sales and service organization. Wallace described a number of questionable items such as luxury resort visits, chartered fishing boats and limousines rented to drive secretaries to work.

"The memo was one financial manager's very strident attempt to catch people's attention," DEC spokesman Mark Fredrickson said. Wallace chose "the most egregious" examples from his research to illustrate his memo, he added.

Fredrickson said the manager's suggestions for trimming \$30 million from expenses have become a goal for the sales and



service organization this year. He noted, however, that that figure should be balanced against revenue of \$5.6 billion the group generated last year.

Big Brother

One problem Wallace highlighted in his sharply worded memo was a frequent violation of a DEC policy that prohibits managers who take part in expense-ac-

count festivities from signing off on the bills afterward.

"Some of the expenses mentioned in the memo were appropriate expenses, but they were not appropriately approved," Fredrickson explained. "We need to manage that more closely."

During the past two years, DEC has been tightening its spending on all fronts as the company tries to ride out the recession through employee layoffs and early retirement programs, consolidating facilities and streamlining management.

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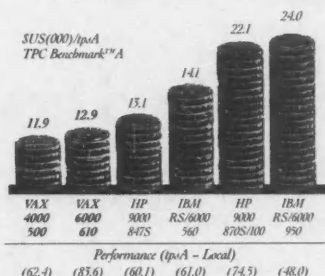
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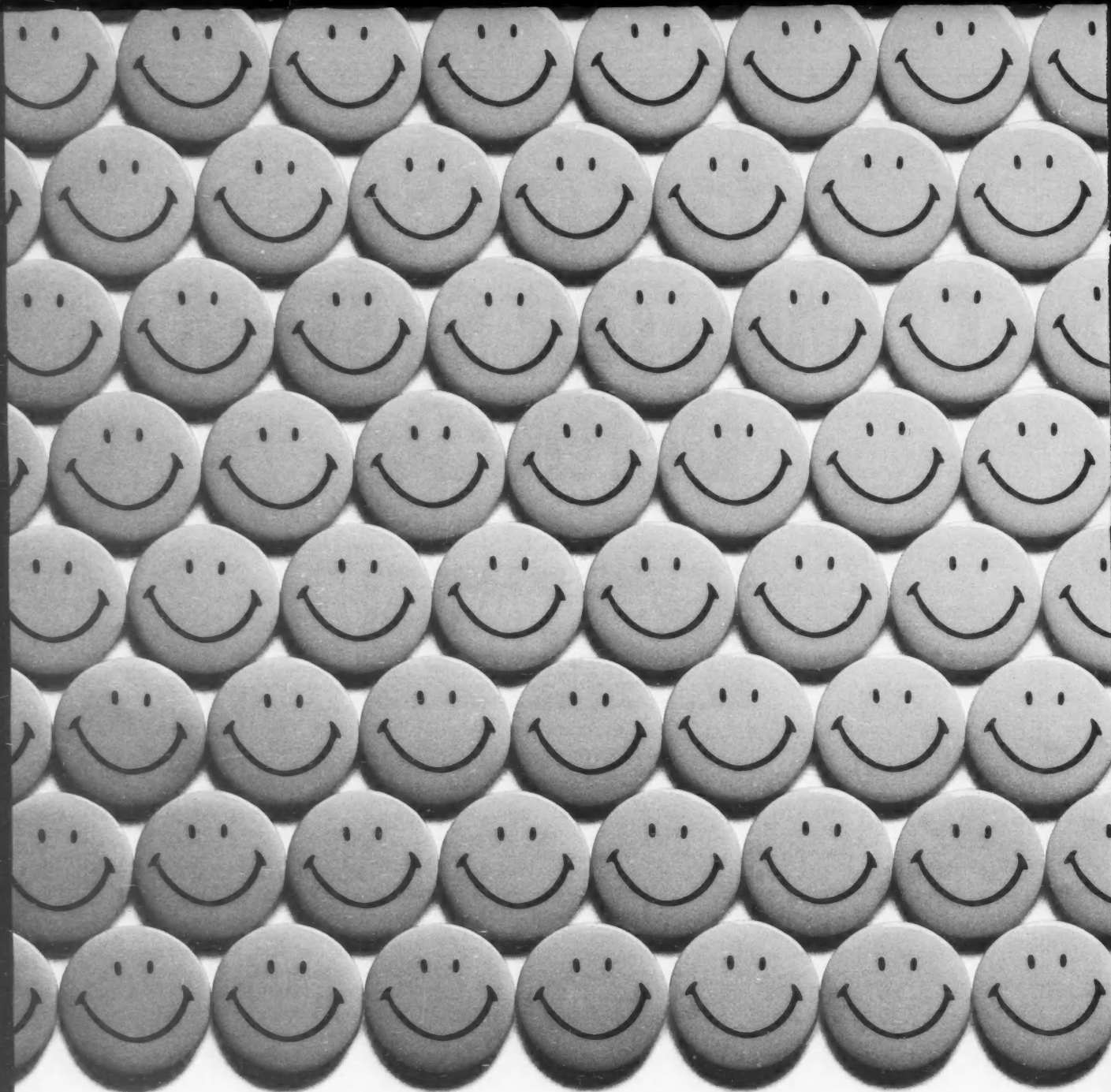
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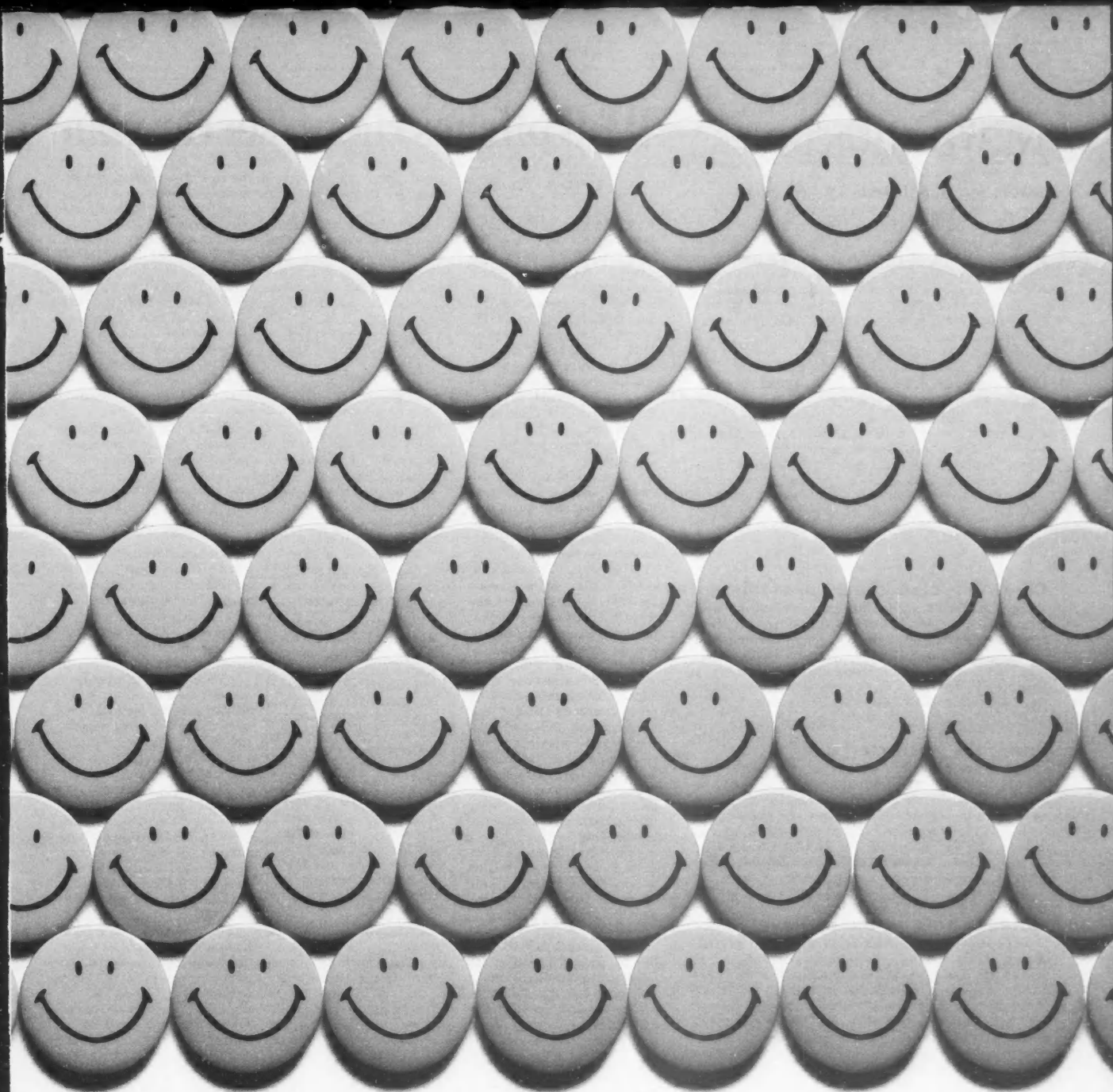
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NEWS SHORTS

Intersolv accelerates CASE push

Intersolv, Inc. is due to unveil a new version of its flagship DOS-based computer-aided software engineering (CASE) product tomorrow. Excelsator II, a \$9,500 upgrade, will reportedly include a local-area network-based repository enabling several developers to work concurrently on the same CASE project, said analysts briefed on the product. Excelsator II will run on IBM OS/2, followed by versions for Microsoft Corp. Windows, Digital Equipment Corp. VAX/VMS and various Unix systems.

DOT oversight of CRS faulted

The U.S. Department of Transportation (DOT) needs to do a better job of monitoring and regulating the vendors of computerized reservation systems (CRS), according to a report issued by the U.S. Congress' General Accounting Office. It said that the DOT should require CRS vendors to eliminate the "architectural bias" that favors the airline owning the system and also needs to undertake an extensive data-gathering effort to update old statistics on the CRS industry. The DOT's effort to revamp the 1984 CRS regulations is more than a year behind schedule.

Confirm system checks in at Hilton

Hilton Hotels Corp. has begun user testing of Confirm, a \$125 million, 4-year-old joint reservation system shared with Marriott Corp., Budget Rent A Car Corp. and American Airlines' information services unit. Hilton is expected to go on-line mid-year, joined by Budget in September and Marriott in November. Hilton's claims Confirm will be the first integrated yield management system for car rental firms and hotels.

Under the (customer) gun

Citing pressure from some of its largest customers, Novell, Inc. has joined three standards organizations: the Open Software Foundation, Unix International, Inc. and the Object Management Group. Separately, Novell announced promotions for NetWare 3.11, including discounts on all new 3.11 licensing packages, bundling of extra software for 3.11 and plans to cut the price of Version 3.2 when it ships this fall for those upgrading to 3.11. The offers are good through July 31.

Notes to bolster text retrieval

Lotus Development Corp. said it signed a deal with Verity, Inc. allowing it to add Verity's text-retrieval technology into its product line. The companies plan to build the Verity engine into the next release of Notes, due out later this year. It will provide Notes with more sophisticated retrieval functions than exist today, including some ad hoc query that "is more like word processing capabilities," a Lotus spokesman said.

Short takes

Mellon Bank Corp. has lost one of its largest and most prestigious outsourcing deals. Dollar Dry Dock Bank canceled its six-year services contract signed in 1990 after parent Emigrant Savings Bank decided to bring information systems back in-house. . . . **Go Corp.** Chairman S. Jerrold Kaplan said Go will market a PenPoint-specific version of **ParaGraph International's** cursive handwriting technology when it becomes available later this year. . . . David R. Dukes was promoted from president to co-chairman and chief operating officer of **Ingram Micro, Inc.**, a microcomputer distributor. . . . **IBM and Graphex Imaging Systems, Inc.** have agreed to sell Graphex's line of color electronic prepress systems, which are based on a reduced instruction set computing-based imaging computer that works in conjunction with IBM's RISC System/6000. . . . **Phar Lap Software, Inc.**, the Cambridge, Mass.-based DOS extender manufacturer, will package its 386/DOS-Extender with **MetaWare, Inc.'s** High C 32-bit compiler. . . . **Central Point Software, Inc.**, a maker of the popular PC Tools utilities software, said Chief Executive Officer Corey Smith has resigned his position and his seat on the board. Former President and Chief Operating Officer Charles M. Boesenberg will replace Smith as CEO and board chairman.

D&B pitches client/server plan

BY SALLY CUSACK
CW STAFF

NEW YORK — One year after sticking its toe in the water, Dun & Bradstreet Software last week formally detailed its client/server strategy.

The three-pronged product set, dubbed Smartstream, Financial Stream Analysis and InterQ, will give D&B Software's mainframe-oriented users Microsoft Corp. Windows-based front ends linked to OS/2 and/or Unix servers in a client/server environment.

D&B Software currently has approximately 12,000 customers using mainframe software systems based on its financial, manufacturing and human resources applications.

Loyalty on the line

While most mainframe users are not quite ready to ditch legacy applications, analysts agreed that D&B Software needs to offer client/server technology to keep its customer base loyal.

Hank Holland, D&B Software's president and chief operating officer, predicted that 40% of the company's installed base will move to the company's client/server technology within the next five years. Bill McNee, an analyst at Gartner Group, Inc. in Stamford, Conn., said 40% is a conservative estimate when talking about the high end of the installed base.

"We've been beating on them for years, trying to get them to do this kind of thing," said Charles J. Darnell, senior vice president at Lithonia Lighting in Conyers, Ga.

Lithonia, which is in the process of putting several of its D&B Software packages onto a mainframe in an IBM DB2 environment, will be adopting the Smartstream technology in the near future. Data will be ac-

cessed using the company's homegrown graphical user interface.

Baxter Healthcare Corp., a 12-year D&B Software customer in Deerfield, Ill., has been beta-testing all three components of D&B Software's client/

during the next several weeks to provide customized views tailored to the health care organization's needs.

D&B Software's long-term viability depends heavily on successfully migrating users to newer technology platforms, McNee said. He noted that D&B Software will soon see competition from other traditional legacy software providers, such as SAP AG in the financial arena and Tesseract Corp. and Integral in the human resources market.

D&B Software is also feeling pressure from relatively new players in the client/server arena such as PeopleSoft, Inc., which has already made strides with its approach to human resources applications.

Supplementary services

D&B Software hopes to solidify its hold on the legacy application market by supplementing its new offerings with extensive re-engineering and consulting services and by partnering with big name consultancies.

"We can provide customers with service as it relates to our product set, but for total software and hardware reconfiguration and planning, we will partner with appropriate outside sources," Holland said.

The company has also restructured its pricing to reflect actual customer use, a trend kicked off by Digital Equipment Corp. last fall when it announced special usage licensing for its Network Application Support product line. Pricing will start at \$99,000.

The products are scheduled for availability in June for OS/2-based server environments. Upcoming releases have been promised for Hewlett-Packard Co.'s HP-UX and Data General Corp.'s DG/UX Unix operating systems.

Streaming forth

D&B Software client/server software offerings include the following:

• **Smartstream** — A Microsoft Windows-based client/server groupware application capable of providing one form of access to data located in a variety of commonly used internal and external databases.

• **Financial Stream Analysis** — A client/server application using Cognos Corp.'s Powerplay data exploration and display tool to give customers easy access to host-based information and produce multidimensional views of data at the workstation level.

• **InterQ** — The communications mechanism through which customers migrate host application data to a local-area network server running a relational database management system.

server line since February. Bill Reiher, director of corporate systems, said it is still "pretty early in the game" to make over-all pronouncements. Baxter will be working with D&B Software

U.S.-sponsored tech group proposed

BY GARY H. ANTHERS
CW STAFF

WASHINGTON, D.C. — A blue-ribbon panel last week called for the establishment of a quasi-governmental corporation to help accelerate the development of fundamental technologies in information processing, microelectronics, artificial intelligence, high-speed networking and other areas.

The panel, sponsored by the National Academies of Science and Engineering and the Institute of Medicine, said the new corporation should receive a one-time infusion of \$5 billion in federal funds but should then operate independent of influence

from Congress and the White House. The new entity is known as the Civilian Technology Corp.

The 15-member panel, which includes senior executives from IBM and AT&T Bell Laboratories, said current government programs supporting research and development are inadequate. "A new federal role in precommercial R&D is necessary, and in our judgment, the U.S. government is capable of executing this mission," the group wrote in a 165-page report.

The report stresses support for "precommercial" work — which precedes product- or process-specific R&D activities — in line with the Bush administra-

tion's disdain for an industrial policy that might tend to favor certain companies.

The panel also stated the following:

• The U.S. Defense Advanced Research Projects Agency's role in developing technologies with both military and civilian uses should be strengthened — especially in the area of information technology.

• A small number of the existing 700 federal laboratories should be selected to work more closely with private firms to enhance technology transfer.

• Funding for, and participation in, the federal Small Business Innovative Research Program should be increased.

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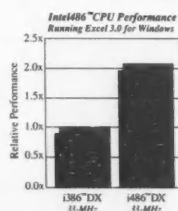


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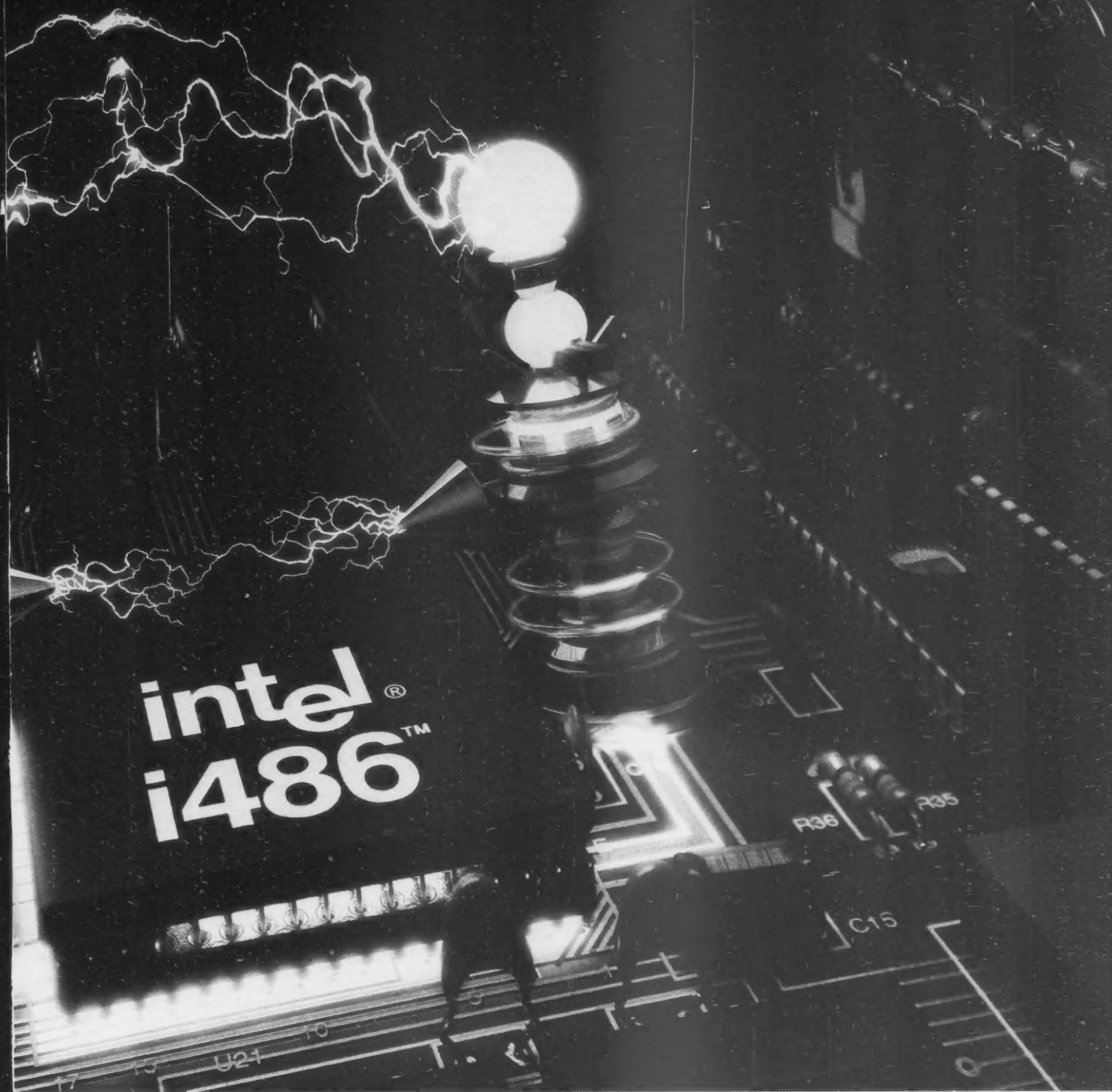
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Transferred employees sue Kodak, DEC

BY CLINTON WILDER
CW STAFF

ROCHESTER, N.Y. — The likelihood of legal action by information systems workers unhappy with a new employer — the outsourcing vendor — has been realized with the filing of a lawsuit against outsourcing pioneer Eastman Kodak Co. and contractor Digital Equipment Corp.

The suit was filed Feb. 25, in federal court here on behalf of 11 former Kodak employees who joined DEC. It charges that both companies misled and coerced employees about benefits packages and

job opportunities when they went to work for DEC. The suit seeks \$5 million in punitive damages on each of three counts plus actual damages to be determined.

Both Kodak and DEC refused to comment on the case, although a Kodak spokesman noted it was the first legal action to arise from the 1989 group of outsourcing contracts. At that time, Kodak farmed out its telecommunications function along with 252 employees to DEC as part of the landmark IS outsourcing deal that included IBM and the former Businessland, Inc.

The case underscores the need for

companies to be extremely careful about promises made to employees who are transferred to the outsourcing vendor, according to legal experts. Although nonunionized employees have few inherent legal rights to specific jobs or compensation, broken promises made to employees could leave an employer vulnerable.

"It's not enough to promise [comparable jobs or benefits] if you're not prepared to carry through with them," said Robert Zahler, a partner specializing in outsourcing con-

tracts at the Washington, D.C., law firm of Shaw, Pittman, Potts & Trowbridge.

In a similar 1990 case, 29 employees at the Nashville Electric Service sued to prevent being hired by Seltmann, Cobb and Bryant, Inc., a Memphis IS services vendor [CW, Nov. 5, 1990]. The employees were unsuccessful in gaining a temporary injunction to prevent the contract, but the case is still pending, their attorney, Jeff Rappuhn said.

Like the Kodak employees, the Nashville Electric workers claimed that their benefits were reduced as a result of switching employers. If the Kodak case goes to trial, the outcome may turn on what was told to the employees.

"The mere fact that an employee's job or benefit was reduced is not unlawful, unless they were specifically promised and assured otherwise," said Richard G. Moon, a partner at Moon, Moss & McGill, a Portland, Maine, firm specializing in employment discrimination law. "What exactly did Kodak say? Sometimes the employees believed they were protected when in fact they were not."

Can't please everyone

Such lawsuits are probably an inevitable result of outsourcing, said Chris Disher, Chicago-based director of Nolan, Norton & Co.'s outsourcing practice. "You have to expect that not everyone is going to be happy with the deal that gets cut," he said. "You can have the best intentions up front, but in the end it's a pretty dramatic change for people to move into a vendor environment."

The four-count complaint alleges fraudulent inducement by DEC and breach of fiduciary duty and age discrimination against Kodak. "There is reason to believe that Kodak has been engaged in targeting older workers in its cutbacks," claimed Donna Marianetti, the employees' attorney.

Marianetti also has approximately 20 other age discrimination suits pending against Kodak, although they are not related to IS outsourcing.

The suit also alleges that DEC told employees last fall that the Kodak contract, known as the Telstar alliance, was not meeting DEC's economic expectations and that DEC was considering "re-outsourcing" to another firm or returning the employees to Kodak. Both companies denied that allegation, saying that they remain committed to the pact.



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EDS lays off 92

DALLAS — Electronic Data Systems Corp. confirmed it will lay off 92 of the 570 information systems employees it inherited from Blue Cross/Blue Shield of Massachusetts, which signed an \$800 million outsourcing contract with EDS two months ago [CW, Jan. 27].

In January, officials had said there would be "no major layoffs" due to outsourcing, but a 60-day review found areas for consolidation, an EDS spokesman said. The displaced employees will remain on the EDS payroll until May 23 and will receive outplacement assistance, the spokesman said.

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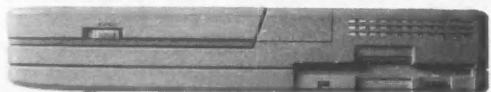




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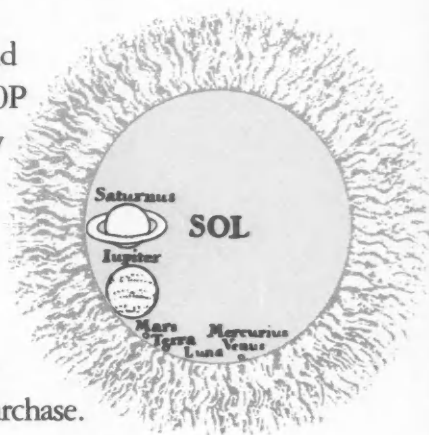
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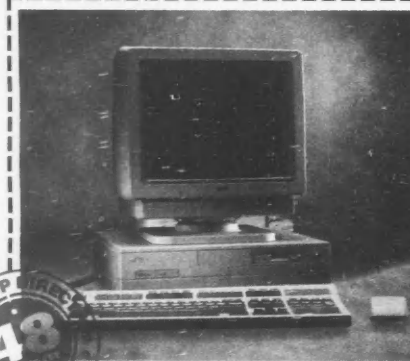
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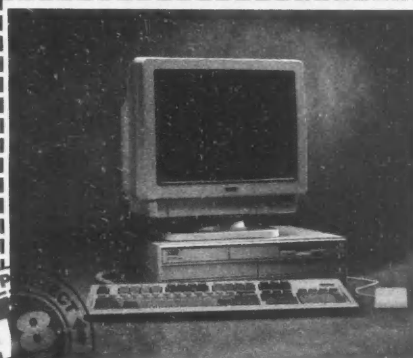


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How many applications will your PC(s) run in a typical workday? _____

What best describes the type of work the system will be used for?
(Check all that apply)

- | | | |
|--|---|--|
| <input type="checkbox"/> Word Processing | <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Scientific Research |
| <input type="checkbox"/> Order-entry | <input type="checkbox"/> Education | <input type="checkbox"/> Software Development |
| <input type="checkbox"/> Database (filing records) | <input type="checkbox"/> Design (CAD/CAM) | <input type="checkbox"/> E-Mail |
| <input type="checkbox"/> Financial Calculations | <input type="checkbox"/> Engineering | <input type="checkbox"/> Other industry-specific applications (please specify) |
| <input type="checkbox"/> Retail Store Management | <input type="checkbox"/> Industrial Process Control | |

How many people work in your group, department or small business?
☐ Less than 10 ☐ 10-20 ☐ 20-35 ☐ More

Is your operating system:
☐ DOS ☐ DOS with Windows ☐ OS/2 ☐ MAC ☐ UNIX™ ☐ Other

Which of the following graphics-oriented applications best describes your needs?
(Check all that apply)

- | | | |
|---|--|--|
| <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Realtime Modeling | <input type="checkbox"/> AutoCad |
| <input type="checkbox"/> CAD/CAM | <input type="checkbox"/> Animation | <input type="checkbox"/> Business Graphics |
| | <input type="checkbox"/> Image Processing | |

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How many PCs do you have installed? _____ From how many manufacturers? _____

What kinds of connections does your PC(s) require? (Check all that apply)

- ☐ Links with other PCs in the immediate surroundings
- ☐ Connection to the local area network (LAN) throughout a building
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What is the networking software now being used in your company? _____

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TECH TALK

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■ Supercomputer maker NCube Corp. in Foster City, Calif., recently sold and installed NCube2 massively parallel processors at six Japanese firms. The sites have reportedly purchased NCube2 systems ranging in size from 16 to 512 processors. Customers include Mitsubishi Electric Corp., Kyoto Sanyo University, Seikei University, the National Laboratory for High Energy Physics and two large research institutes. Applications for the supercomputers in the new installations range from neural net research simulating visual perception to parallel processing research for applied mathematics.

Fuzzy logic made clear

■ The Motorola Microprocessor and Memory Technologies Group and fuzzy logic developer Aptronix have said they will establish the Fuzzy System Standard Environment, a data structure by which fuzzy logic systems are represented, as a public-domain standard. San Jose, Calif.-based Aptronix will also support Motorola microcontrollers with its Fuzzy Inference Development Environment software development tools. Announcements of the data structure and tools are said to be initial moves in a Motorola program to bring fuzzy logic and related technologies to the market.

DRAM on

■ Rambus, Inc. has teamed with three large semiconductor manufacturers that will incorporate a Rambus dynamic random-access memory architecture and high-speed component interface into their chips. According to Rambus, Fujitsu Ltd., NEC Corp. and Toshiba Corp. have licensed the DRAM, said to deliver data at 500M byte/sec., to a logic device with the Rambus interface. The technology reportedly addresses memory bottlenecks faced by system designers.

High tech takes to theater stage

Computer-generated animation adds visual spark to play performances

BY CLINTON WILDER
CW STAFF

For all of its creativity, live theater has not been a hotbed for the application of computer technology. While certain films — for example, *Who Framed Roger Rabbit?* and *Terminator 2* — have been lauded for their computer-generated animation and effects, computers in the theater have largely been restricted to offstage duties such as controlling lighting and recording ticket sales.

However, that may be changing in the converted neo-Gothic church that houses the George Coates Performance Works in San Francisco's civic center — thanks to a successful musical. The production of *Invisible Site: A Virtual Sho* claims to be the first stage show to feature live performers interacting with projected computer graphics in real time. In one scene, an actor playing the Dalai Lama walks with computer-projected fire and water around his head, while in another scene characters run to escape the gaze of a huge, hovering eyeball.

The show is the brainchild of George Coates, a leader in a movement to unite

COATES SAID HE strongly believes that artistic creativity can be a driver of technology innovation.

computer technology with the arts. Coates, founder of The Science Meets Art Society (Smarts), said he strongly believes that artistic creativity can be a driver of technology innovation.

"It's a whole different beast from word processing and spreadsheets — it's not a linear attention stream," Coates said. "I get the biggest thrill when these [technology] guys see an application they wouldn't have dreamed of before."

Coates works closely on *Invisible Site* with graphics specialists from Silicon Graphics, Inc. in nearby Mountain View, Calif. Graphics generated on a Silicon Graphics Iris 4D/320 VGX Model 60 workstation — ranging from the eyeball to gyrating wire mesh humanoid figures — share scenes and interact with the show's cast of seven real actors and actresses.

Animation specialist Frances Dose is considered a live performer in the technology booth at the back of the theater, manipulating the images with a joystick in response to performers' movements. The show uses an 80K bit/sec. data projector from Esprit Projection Systems, Inc. in Titusville, Fla., to project the graphics on a translucent



Actors appear to walk through a computer-generated 3-D grid projected onstage during a live performance of *Invisible Site*

screen in front of the actors; the audience wears three-dimensional glasses to create the illusion of no screen.

The story of *Invisible Site* actually takes place inside a computer. An unauthorized hacker invades a futuristic virtual reality game in which on-line users travel to the fantasy worlds of Shakespeare and Rimbaud. Coates premiered the show at the 1991 Siggraph computer graphics trade show in Las Vegas.

The *Invisible Site* technology team also uses an Apple Computer, Inc. Macintosh IIfx for graphics modeling and a Digital Equipment Corp. VAXstation 5000/120, running Autodesk, Inc.'s Autocad, for computer-aided set design. Graphics software includes Life Forms (for the wire mesh figures) from Canadian developer Kinetic Effects, Inc., Ntitle from Xaos Tools in San Francisco and a computational flow dynamics program developed at the NASA Ames Research Center in Mountain View.

Lucky find

One of the show's most impressive effects was an accidental discovery. One day in rehearsals, Coates noticed a Silicon Graphics designer manipulating a bright blue 3-D grid on the screen and was told it was merely the software map on which the graphics were generated. But Coates loved the speed of the manipulation, enabled by the relatively small amount of data being projected. He incorporated it into an interactive scene with the actors, who appear to be swimming in and out of the grid.

The Life Forms software-generated wire-frame figures in the show were another "accident," Coates said. Although the grid-like figures are normally used by graphics specialists as the starting point for fully shaded forms, Coates said he liked the way they looked in interacting with the real actors on stage. In one memorable scene, a wire-frame "man" runs with the actors into the projected image of a de-

serted San Francisco alley and then sets himself on fire.

The graphics team "thought we would use Life Forms as an authoring tool," Coates said. "They didn't know we would blast it up on stage as actual characters."

That is the kind of serendipity that Coates treasures. "Not knowing how this stuff works is the first step toward genuine discovery," he said. "True discoveries occur when you don't know what you're looking for."

When Coates needed some of *Invisible Site*'s graphic projections to be changed faster, for example, Silicon Graphics engineer Tim Heidmann was able to rewrite the software. "That created new tools that they didn't have before," Coates said.

Exploring possibilities

Coates hopes to spur additional discoveries through Smarts, an attempt to hook up the brilliant technical minds of Silicon Valley with the growing ranks of multimedia artists. He has presented his ideas to the Multimedia Roundtable, an annual industry gathering at UCLA's Anderson Graduate School of Business that includes Apple Chairman John Sculley, Apple Fellow Alan Kay and MIT Media Lab founder Nicholas Negroponte.

An immediate commercial application of high-technology theater is corporate and conference presentations, as Coates demonstrated himself at last year's roundtable. He produced a 40-min. multimedia presentation of speeches from the 1990 roundtable, combining text, audio, graphics, photos and video.

"I decided it was inexcusable and ludicrous to talk about multimedia by just standing behind a podium," Coates said. "So much information is presented at conferences in hotels, where the rooms are not multimedia-friendly. In fact, they are multimedia-stupid. They have got to rethink those places."

EDITORIAL

Reinsourcements

For some time now, the subject of outsourcing has merited as much ink as any other discrete area we write about. The outsourcing deals have been huge — and getting more so, it seems.

When it came to stating an opinion about this phenomenon, what we've consistently said is that the lasting benefits and true costs of outsourcing will come to light only over a period of time. The fact is that almost any outsourcing provider can, as one IS director once told me, "do it for 10% less than whatever your IS operation is costing the company now."

We've also argued that companies ought to think very carefully about outsourcing vast amounts of their IS operations, given survey results from the *Computerworld/Andersen Consulting* study of Fortune 1,000 senior corporate executives that showed the perception of a powerful relationship between corporate IS and the attainment of corporate goals.

Some recent developments are reinforcing this message of looking very carefully before you leap.

The far-and-away most celebrated outsourcing effort — that undertaken at Eastman Kodak three years ago — is showing some wear and tear. Earlier this month, 11 former Kodak IS workers who were transferred to DEC's payroll as part of the outsourcing contract filed an age-discrimination suit against both companies, claiming they were misled about a continuation of employee benefits and career opportunities.

Kodak's other two outsourcing partners are IBM and the now-defunct Businessland. Kodak officials insist Businessland's new owner is fulfilling the contract obligations and that IBM's service has not been affected by Big Blue's own problems. But when asked whether Kodak is getting the same service it would have had all three providers been as healthy today as they were three years ago, Kodak is less definitive.

Also last week, nearly 100 former IS workers at Blue Cross/Blue Shield of Massachusetts got pink slips from their new boss, EDS, which won the outsourcing contract there. Some layoffs were expected. Will getting laid off from EDS carry the same benefits as getting laid off from Blue Cross/Blue Shield? That's not completely clear. If the benefits aren't as good (read: as costly), then the kind of lawsuit that cropped up at Kodak could become more common.

We're certainly not Luddites when it comes to outsourcing; in a number of instances, it makes perfect economic and strategic sense. For example, both EDS and Computer Sciences Corp. have a wealth of experience dealing in claims processing from handling Medicare, Medicaid and even food stamps contracts. And some companies, like Kodak, maintain control of key aspects of IS.

Yet until all the cards in some of the long-term outsourcing deals have been played, companies should proceed with caution.

Bill Laberis
Bill Laberis, Editor in Chief



LETTERS TO THE EDITOR

Many factors contribute to poor product documentation . . .

I read Nancy S. Mueller's diatribe against poor documentation ["Fed up with bad directions," CW, March 9] with a mixture of appreciation and dismay.

In her favor, she begins by identifying a key issue: The press does not report "bugs" caused by defective documentation. She concludes that such documents need quality checking — a worthwhile suggestion. But she does not address the causes of these so-called bugs. As a writer of such documents, I contend the following:

- Documentation is usually the last step (and an afterthought) in the development process. How many "README" files have you had to read?
- Last-minute changes in programming often do not make it to tech writers.
- The review of documents by programmers, analysts and others is not given due priority.
- Development efforts are inadequately documented, making it difficult to find the right person or document to find answers.

Documentation is rarely a revenue-producing department, so budget constraints are tight, and its efforts are slighted.

A good portion of technical documents are not written by writers. Programmers, analysts, design personnel and even secretaries are given these duties in many circumstances. The right

tool for this job is a person trained in the art of writing who also understands the technology.

I believe an industrywide commitment to deal with the problem of poor documentation is in order. In an industry where photocopying often pays better than innovating, we would all benefit from it.

Mike McKinlay
CyCare Systems, Inc.
Dubuque, Iowa

... and it's the bottom line that suffers

Kudos for "Fed up with bad directions" by Nancy S. Mueller [CW, March 9]. She points out the low value many software and hardware vendors place on documentation and quality assurance. How true.

The problem of giving documentation a low priority and skimping on quality assurance testing is not limited to those vendors. It exists in many businesses, large and small.

It's amazing how many companies are willing to pay large dollars for programming, then skip the quality assurance phase altogether and part with very few dollars for documentation. They don't seem to realize that no matter how good the end product is, without good documentation no one will understand how to use it, probably won't use it and won't recommend it to anyone else.

The bottom line is: Documentation and quality assurance testing are key elements in the creation of a successful product.

Richard Kuper
President
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California licenses fearful technology

Your article on new California driver's licenses ("New Calif. license speeds law," CW, March 9) is terrifying.

I thought only accused criminals had to be fingerprinted.

I am disturbed that any retail merchant could "grab" all my personal information from this kind of driver's license. Will they use it to track my movements and to see if I am purchasing anything subversive? Will I be afraid to buy anything that is not politically

correct? Will the "data-packed" magnetic strip hold my medical records? This is a very frightening scenario.

The final irony is your Page 1 article in the same issue, "Personal data more public than you think." I guess so.

All citizen "data" is controlled by the "state" (a kinder and gentler one, of course) and sold to anyone who has the money to buy it.

Anthony Freedman
Springfield, Pa.

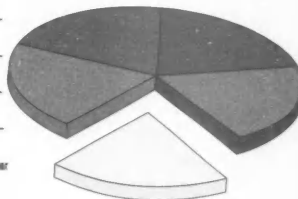
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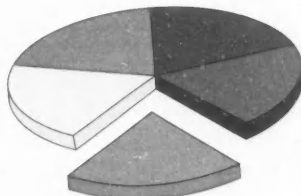
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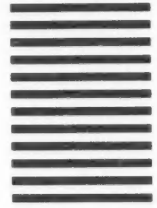
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Michelangelo's real message

DON TENNANT

The Michelangelo virus has come and gone, and neither the painter's reputation nor the industry will ever be quite the same.

Before long, some pollster will undoubtedly publish a survey indicating that in response to the question, "Who or what is Michelangelo?", 98.6% of the respondents looked away from the television long enough to say, "Duh, it's a computer virus."

Now that the subject of computer viruses has made it into the media mainstream — thanks in large part to whatever cute prankster gave us the Michelangelo strain — the industry has suddenly begun to change.

Antivirus boom

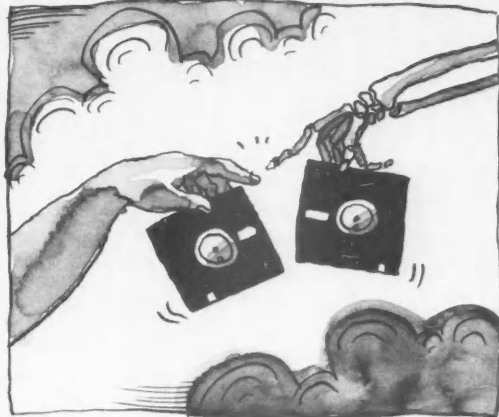
So far, the biggest alteration has been the meteoric rise of antivirus products. Previously obscure antivirus packages are now the hottest selling desktop software items on the market, and overnight it has become fashionable to drop the clever names of other impending viruses at swank social gatherings.

VIC Computer, a Hong Kong company that sells antivirus software, has compiled a preview of some of the coming attractions

(as a public service, no doubt). There's the Prudent Virus in May, Tiananmen on June 4, Blood Virus in August, Cascade Virus in September, Data Crime in October, another Jerusalem

shareware.

When that becomes clear — when customers start to realize that they can become infected, even if they carry a credit card to purchase original software from



Nicola Ascio

attack in mid-December, 1253 Anti-CAD Virus in late December and, of course, Christmas Virus on Dec. 25. Joy to the world.

But what hasn't hit with full force yet is the realization that viruses can be caught from legitimate products — that they aren't just caused by rogues in networks or casual contact with

reputable dealers — the software industry is going to have to either change its practices quickly or cope with a mean backlash from users.

The evidence is already there, for anyone who looks.

For example, Novell customers who received the December release of the network giant's

support encyclopedia got a free bonus: the Stoned III virus. At about the same time, resellers in the U.S. received 500 computers from Leading Edge Products with Michelangelo-infected hard disks.

Then in February, Da Vinci Systems mailed 900 infected demonstration disks to customers and resellers. And this month, Intel announced that a virus had infected one of its print utilities.

And the list goes on. A Hong Kong computer consultant recently reported that all seven disks in a sealed Microsoft Windows 3.0 package purchased from a distributor were infected with a sophisticated virus that began to do damage as soon as he installed it on a client's network.

Wake-up call for vendors

One concern that is sure to crop up in the wake of these reports is that users will cite them to rationalize buying pirated software or to defend making illegal copies themselves.

If that outcome is to be prevented, software manufacturers must take their customers' reports of shrink-wrapped viruses seriously. That means taking immediate measures to assist and compensate those customers and initiating well-publicized steps to prevent a recurrence.

Tennant is editor of *Computerworld Hong Kong*.

CIOs do have a purpose in corporate America

MICHAEL COHN



Enough already with all this CIO bashing. Chief information officers are not bad people. They are not evil. In fact, some of my best friends are CIOs . . . or at least they were CIOs.

Anyway, they're nice people. They pay their taxes. With proper care and training, some of them even lead relatively productive lives.

It's time to protect the few CIOs we have left. Maybe somewhere there are simple little computers with gen-it-yourself operating systems, distributed everything and user-friendly tools that unwrap themselves and open the manuals to the right page, but nobody I know has ever seen them. Big information systems shops need big IS leaders and big IS salaries. Just think about the terrible things that would happen if we didn't have CIOs to kick around:

• **There would be no IS plan.** No one would get to bless anything, or approve anything, or hunt down and confiscate user-smuggled 4GLs. Without a CIO, users would run out and buy cheapo PCs and load their own software and spread their own spreadsheets all over the place.

Would users be happy? They'd think so, but without standards, all they would have is stuff that worked, instead of stuff that didn't work the same for everybody.

• **IS would have no leadership.** The department would be

in react mode. There would be application backlogs and burnt-out programmers. Everyone would spend all kinds of time fighting fires, pacifying users and trying to keep the system up and running 80% of the time.

So what's different, you say? There's a big difference — no one to blame.

• **No one would do the IS budget.** No one would argue about operating costs, FTEs or processor upgrades. IS would have no bucks at all, and every time they wanted anything, they'd have to go to a controller, the chief financial officer or some other user and ask for it . . . maybe even cost-justify it.

Imagine IS asking users for something — it's enough to make you sick.

• **Executives would have no high-tech liaison.** There would be no IS advocate. No pin-striped professional to provide the business with crucial day-to-day technical advice and explanations, like "The system will be

down until Wednesday, sorry," or "Hit Alt-Ctrl-Delete and try again."

• **Thousands of IS-related jobs would dry up.** This would plunge the country further into recession. Vendors would have no one to schmooze. Headhunters would have to find real jobs.

IT'S TIME TO PROTECT the few CIOs we have left. . . . Just think about the terrible things that would happen if we didn't have CIOs to kick around.

And the logoed coffee mug industry would completely bite the dust.

• **Finally, without CIOs, no one would get the big picture.** It is vision that positions a company for the year 2000. It is vision that will deliver the right information at the right time and the right cost. For goodness sake, don't let someone with talent like that walk out the door. Encourage that person. Reward that person.

Or better yet, introduce him to the CIO, before things really get screwed up.

Cohn works for a very large computer company in Atlanta.

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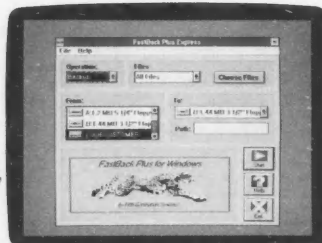
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Apple System 7.0 plan stirs support worries

BY JAMES DALY
CW STAFF

Apple Computer, Inc.'s plan to allow Macintosh users to customize their operating system and graphical interface is already generating flak from those fearing added support costs and administrative confusion.

Several users contacted recently by *Computerworld* remained uncertain about the efficacy of the modification scheme, which Apple said will unfold over the next 18 months. "I think Apple is overestimating our ability to change and upgrade constantly — we just can't afford the hassle," said Fred Morsheimer, director of management information services at Trader Joe's Co., a specialty food retailer in South Pasadena, Calif.

At a software summit earlier this month, Apple officials said they would evolve System 7.0 by releasing snap-on extensions designed to allow users to either add or ignore advanced functionality.

Macintosh system software

manager Phac Le Tuan also described Apple's intention to modify the Macintosh interface in favor of a number of screens tailor-made to specific audiences. Sophisticated users would have a better way to manage complex systems, for instance, through piles containing stacks of folders rather than simple folders, he said.

A novice user could also experience a friendlier way of navigating a computer screen with an interface that lets users launch selected applications without interacting directly with the Finder feature, Le Tuan added. "It's no longer possible to say that one size fits all," he said. "There are different levels of sophistication and need, and we want the system and user interface to reflect that."

But users have already begun to voice concerns about the repercussions such changes could bring to system management. "There will be no consistency because everyone will have a slightly fragmented version

Continued on page 38

Users juggle OS/2, Windows

BY ROSEMARY HAMILTON
CW STAFF

Delta Air Lines has two major software projects under way based on IBM's OS/2 operating system. Nonetheless, the company has not yet officially committed to the IBM platform and is keeping an open mind about Microsoft Corp.'s Windows, said Ron Eubanks, director of communications and information services support.

"OS/2 and Windows are still competing against each other as far as how we use them and when," Eubanks said.

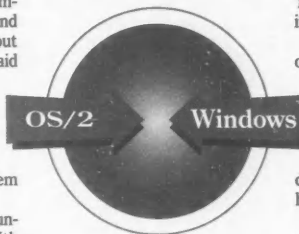
Delta's approach is not uncommon these days. Faced with an uncertain market that sometimes pits OS/2 and Windows against each other, some customers are trying to protect themselves by leaving the door open for both vendors.

"The watchword is stay loose, you know?" said John C. Roberts, vice president of corporate research and technology at Unum Corp. in Portland, Maine.

"We are really concerned about the conflict between these two companies," Roberts added. "It's put the customer in

the middle."

Currently, Unum is using a desktop strategy that incorporates both Windows and OS/2. For end-user applications, Windows is emerging as the key platform, but for internally devel-



oped business applications, the choice is OS/2.

"It would be a goal" to eventually have one primary desktop platform, but "whether the marketplace allows that to occur is still a question mark," Roberts said.

Not much choice

The downside, he added, is the additional support costs from maintaining both operating systems as key platforms. "That doesn't make us happy," he said.

"But that's reality."

The Principal Financial Group in Des Moines, Iowa, is operating with a strategy that is similar to Unum's — one that calls for the company to "cover all bases," said Allan VanThomme, associate director of information systems.

"We are trying to position ourselves to do support for either Windows or OS/2," VanThomme added. "Our current thought is OS/2 will be on a smaller number of workstations than Windows, but both will be installed here."

And like Unum, Principal Financial said the additional support to maintain the mixed workstation environment is costly. "The support costs are high," he said. "You get a lot of people tied up in making sure the workstations run effectively."

VanThomme said the majority of the 3,500 workstations are still running DOS. If OS/2 successfully runs integrated Windows applications, he explained, then "we could standardize on it, but that's dependent on so many things, like how much hardware, how expensive it would be."

TrueType bargain fires up battle of the fonts

BY CAROL HILDEBRAND
CW STAFF

REDMOND, Wash. — The advent of Microsoft Corp.'s Windows 3.1 operating system has raised the heat in the simmering font wars among Microsoft, sidekick Apple Computer, Inc. and rival Adobe Systems, Inc.

For the first time, Windows 3.1 — due to be released next week — will come standard with 14 TrueType fonts bundled into the system. Microsoft is dan-

gling an extra carrot in the form of the TrueType Font Pack for Windows — 44 additional fonts that can be had for \$99.95.

The Font Pack is made up of typefaces from Monotype Typography, Inc. and Bigelow & Holmes, Inc. The Monotype fonts, along with those standard on Windows, make up a collection that matches the standard Type 1 fonts found on most PostScript printers. The Bigelow & Holmes fonts comprise a mix-and-match group that target

novice users, noted Daniel Steele, director of marketing at Microsoft's Windows printing group.

Because the rasterizer for TrueType is part of Windows, installation is very simple. The set-up program then makes the fonts available to all Windows-based applications.

Gauntlet thrown

Barry Tepper, an analyst at BIS Strategic Decisions in Norwell, Mass., said that Microsoft's

maneuverings presented a serious challenge to rival font makers.

"The company that owns the platform owns the fonts," he said. "It's going to be somewhere between difficult and impossible for anybody to ignore that."

Tepper said that with the fonts available gratis on both Apple's System 7.0 operating system and Windows 3.1, the situation represents a marketing challenge more than an issue of

features or quality.

"Adobe is going to have to react to the situation one way or another. While it's true that lots of people have bought Adobe Type Manager, if you don't already own Adobe typefaces, I doubt that many people will see a reason to buy them," Tepper said.

Daniel Will-Harris, author of "WordPerfect for Windows with Style" and a TrueType beta-test user, agreed.

"It's not really a matter of being better; it's matter of being more convenient and faster," he said.

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COMMENTARY

Jesse Berst

Are pens mightier than keyboards?



One of my jobs in this column is to watch the world of Windows and OS/2 and act as your early warning system. I'm especially alert for two things: Overblown ideas that could be dead ends for IS departments and new technologies that could give you a competitive edge.

In the next two installments, I want to talk about a development that's a little bit of both: Windows for pen computing.

Before going any further, I want to acknowledge that there are at least six other pen environments. As it happens, virtually all of my comments about pen Windows apply to the other systems, too. And pen Windows is the one garnering the most support from commercial developers.

I investigated by getting sneak previews of forthcoming products, talking to programmers and product managers, trying out some of the systems and interviewing end users. I'll spend this installment on the bad news.

Beware, pen enthusiasts

I have four warnings for IS professionals interested in pen computing.

Warning No. 1: Don't get your hopes up too high about handwriting recognition. Recognition is one of those "gee-whiz" technologies that you hear a lot about. But if you focus on recognition as the main opportunity, you're heading down the wrong road.

Indeed, we don't actually have handwriting recognition yet. We have handwriting recognition, and there's a big difference. What's more, most recognizers have to be "trained" for each user before they become accurate. Handwriting recognition has made great strides in the past year, and it will continue to get better. But even if the recognizer is perfect, it can still only read block letters.

If you have a vision of a mobile application where users scribble happily away, please put it aside. That's not where the payoff will be. Recognition is fine for small bits of data — the name and address on a form, for instance. But the rest of the form needs to be constructed in point-and-click fashion before it will be useful.

Warning No. 2: Realizing the limitations of recognition, vendors have started talking about "ink." That's the idea of jotting on the screen and not even trying to recognize it. You simply store a picture of your scribbles. You might, for instance, circle important passages in an electronic field service manual and jot comments in the margin. Or you might take notes in a meeting and then index them for future reference.

But ink has its own problems. Today's screens are too small, and the resolution is too coarse. You feel like you're writing with a fat crayon on a small piece of paper. And since ink is stored as a bit-map, it takes up lots of disk space.

Warning No. 3: Pen-based hardware is experiencing delays. It has taken

longer than expected to get these systems tested, and few machines are shipping.

We're still on the steep part of the technology curve. Today's models are underpowered and overpriced. They make too many compromises: screens that are too dim, processors that are too slow, hard disks that are too small, form factors that are too bulky.

Taken separately, none of these problems is serious. Taken together, they add up to a disappointing computing experience. Fortunately, manufacturers are already at work on new, improved versions. Judging by the prototypes, we'll have some really slick machines by this time next year. Until then, be careful.

Warning No. 4: Programmers

haven't become very good yet at optimizing software for use with the pen. Many times, they simply use the pen as a substitute for the mouse. Even so-called "pen-centric" applications may disappoint you.

For instance, many pen-oriented programs put very small "targets" on the screen. You find yourself cursing the designer as you try to locate tiny buttons and tabs on a dim, undersized screen.

Most pen demonstrations are done on desktop computers with large, colorful screens. But don't be fooled — that's not the reality of pen computing. Mobile computing will be done with monochrome LCD displays for some time.

Few commercial developers have had the time and resources to throw at this latest platform. Consequently, many

are putting out "pen-aware" applications, not "pen-centric" applications. These applications work with the pen, but they do not use it to its best advantage.

As with the hardware limitations, these software problems will disappear over time. In the short term, however, be aware of their existence lest you sentence a pen-based pilot project to a very unpleasant experience.

Despite problems, I'm convinced that pen computing has enormous potential for quick payback if you use it right. In the next installment, I'll explain why.

Berst is publisher of the Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

Are you using a main- frame?

Autodesk extends AutoCAD to Windows

BY CAROL HILDEBRAND
CW STAFF

SAN FRANCISCO — Autodesk, Inc. unshuttered its Microsoft Corp. Windows strategy with the announcement of AutoCAD Release 11 Extension for Windows.

The product begins the computer-aided design (CAD) leader's migration to the Windows market. While a full-blown Windows offering is in the works, many analysts and users said CAD programs need the 32-bit capabilities not yet available on Windows to appeal to hard-core users.

"For the most part, people who are

heavy CAD users are going to want to stay with the DOS product because it's faster," said Brad Bredehoft, an analyst at Shearson Lehman Brothers, Inc.

The Extension product, he said, is the beginning of Autodesk's wooing of a less technically oriented crowd — users that do not require CAD capabilities on a full-time basis.

"They've talked about trying to expand their market beyond the typical CAD user, and I think this will do that. In the past, AutoCAD was sometimes viewed as too techie and hard to use. This may help open some doors for them,"

Bredehoft said.

Run in conjunction with DOS-based AutoCAD, the Extension supports such Windows features as the tool bar, clipboard, Dynamic Data Exchange and Help functions.

Richard Nash, a beta-test user and senior designer at Unocal Corp., a petroleum company in Ventura, Calif., said the Windows format eased the chief problem he has always had with AutoCAD: working with text in the program.

"The weakest link in AutoCAD has always been text handling. Editing was like going to hell in a rowboat," he said. By us-

ing the clipboard and pasting abilities of Windows, he said, the problem is eliminated.

Another beta-test user at a large entertainment company in California said that although using a CAD product in conjunction with Windows presents speed limitations, "it's much easier to train someone on Windows AutoCAD than it is on DOS. It's a wonderful way to utilize AutoCAD without becoming a CAD guru," he said.

AutoCAD Extension 11 for Windows is available now and is priced at \$99.

Tiny drive market grows

BY MICHAEL FITZGERALD
CW STAFF

SAN JOSE, Calif. — Tiny disk drives coming to market will push portable computers into the subnotebook range and could lead to new ways to exchange data, an official at one company entering the 1.8-in. drive market said.

The 1.8-in. drive market was created by Integral Peripherals, Inc. but gained a new player last week when Ministor Peripherals Corp. brought out four 1.8-in. drives: two 32M-byte drives and two 64M-byte drives. Ministor officials said they expect their real competition to come from vendors who have not yet announced 1.8-in. drives, such as Conner Peripherals, Inc., Seagate Technology, Inc. and IBM.

One model of each capacity drive is designed for embedded use, with an Integrated Drive Electronics interface. The other models — the 64P and 32P — target portables and have a Personal Computer Memory Card International Association interface. The 32M-byte versions cost \$280, and the 64M-byte versions are priced at \$380.

Ministor expects to ship evaluation units in April, with volume production coming in September.

Ministor's vice president of sales and marketing, James N. Miller, said Integral and Ministor would not be true competitors because Ministor's tiny drives — and those of the other companies that will make 1.8-in. drives — represent complete redesigns, whereas Integral has simply taken a 3 1/2-in. drive and shrunk it.

Miller argued that conventional hard drives are not designed to be pulled out of machines and carried around, while Ministor's drives can do exactly that.

According to Miller, Ministor officials said they believe the advent of 1.8-in. drives will lead to new ways of data swapping.

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Apple plan stirs worries

CONTINUED FROM PAGE 35

of System 7.0," said Mike Bailey, a systems integrator at Lockheed Corp.'s missile and Space Division in Sunnyvale, Calif. "Spread out a couple of hundred Macs over a few buildings, and you aren't going to have a clue what they all have."

Apple officials still defend the plan. Le Tuan said Apple engineers are working on ways to minimize confusion, including a software add-on method that would let a network administrator know how each personal computer was configured.

Another possibility is a network regulator that would allow customization from a central base but prohibit individual users from changing their machines without their administrator's knowledge. "We're not interested in creating an environment that is impossible to support," Le Tuan said. He added that these products would be released either by Apple or by a third party but would give no schedule for their release.

Apple will have to move quickly, how-

ever, because some of the snap-on extensions are already available. The firm already offers multimedia capabilities with Quicktime, an extension designed to make the integration of sound, video and animation into Macintosh applications more affordable and accessible.

More to come

Other upcoming extensions include the Open Collaboration Environment, which will feature a set of application programming interfaces that can be used to link disparate applications.

Trader Joe's Morsheimer said the firm is considering installing a Macintosh-based point-of-sale system throughout the 45 stores the retailer operates in California.

"We don't want a million different variations of the Mac out there that we can't handle," Morsheimer said. "We want to do more with less. There are simply too many hidden costs in change."

NEW PRODUCTS

Software utilities

AddStor, Inc. has updated SuperStor, its compression software.

In addition to improved compression ratios, SuperStor 2.0 offers several new features. Personal computers that do not run SuperStor can now read compressed files and save them in expanded form. Compressed data can also be written more easily to floppy disks.

The utility costs \$139. SuperStor 1.3 users can upgrade for \$29.

AddStor
3905 Bohannon Drive
Menlo Park, Calif. 94025
(415) 688-0470

Macintosh products

Adobe Systems, Inc. has expanded its Adobe Font Folio hard disk.

The subsystem now includes packages 1 through 250 of the Adobe Type Library on a 105M-byte external hard drive. It can be attached to any PostScript printer through the Small Computer Systems Interface port.

The product also includes Adobe Type Manager and other utilities.

The disk costs \$14,000. Separate versions are offered for Apple Computer, Inc. Macintoshes and IBM-compatible personal computers.

Adobe Systems
1585 Charleston Road
Mountain View, Calif. 94039
(415) 961-4400

Peripherals

Nutmeg Systems, Inc. has started shipping the Nutmeg Flex 8 LC/si and Nutmeg Flex 8-24 MAX graphics cards for the Apple Computer, Inc. Macintosh.

The Flex 8 LC/si (\$999) supports resolutions ranging from 512 by 384 pixels up to 1,152 by 882 pixels in up to 8-bit mode.

The Flex 8-24 MAX card (\$1,599) accelerates graphics performance. It works with 24-bit color at 640-by-480-pixel res-

olution and handles higher resolutions for 8- and 16-bit color.

Nutmeg Systems
25 South Ave.
New Canaan, Conn. 06840
(203) 966-3226

Quickpath Systems, Inc. has devised PortFolio, an integrated drive electronics (IDE) interface device that saves expansion slots in personal computers.

The unit combines all serial, parallel, IDE, floppy drive and game-port functions into a single 16-bit add-in card. Users can connect a laser printer, dot matrix printer, up to four 1.2M- or 1.44M-byte floppy drives, two IDE drives, a tape backup unit, a serial mouse, a modem and a joystick through a single PortFolio card. A Quickpath floppy BIOS upgrade is included to upgrade systems that do not normally support four floppy drives.

The \$95 cost includes cables for nine ports.

Quickpath Systems
44053 S. Grimmer Blvd.
Fremont, Calif. 94538
(510) 651-8848

Software applications packages

HEM Data Corp. has announced the release of Snap-Master Analysis, a scientific and engineering analysis software package for Microsoft Corp.'s Windows environment.

The product includes a point-and-click interface for building complex equations and a tabular format for defining and storing constants and equations. It handles trigonometric, logarithmic and statistical functions, along with auto and cross correlation, smoothing, three types of differentiation and five types of integration. All available functions are accessed through English language commands.

Snap-Master Analysis costs \$495.

HEM Data
Suite 200
17336 12 Mile Road
Southfield, Mich. 48076
(313) 559-5607



White Paper

WORKGROUP TECHNOLOGY:
TYING TECHNOLOGY TO
BUSINESS OBJECTIVES

IDC White Paper

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Introduction

At a time when so much emphasis is being put on the importance of understanding and automating specific business functions, workgroup computing is increasingly providing solutions for users. Its ability to create quantifiable hard-dollar savings while bringing people together in productive work environments puts it in an ideal position to prosper in the '90s and beyond.

Properly applied, workgroup systems have the potential to spark productivity increases that far outstrip any produced by the heralded personal productivity applications of the '80s. And the value of these systems is only enhanced by their ability to augment, not supercede, existing technology investments.

Whether it be a "group" of two people or 200, workgroup computing can be deployed successfully. Its benefits include ease of use, scalability, security, heterogeneous support and the availability of more meaningful data. One of its greatest attributes is its openness to customization. This openness allows users to gain invaluable knowledge about their business processes while customizing off-the-shelf products or developing their own workgroup computing software.

Despite the many benefits, success with workgroup systems does not always come without a price. Unrealistic expectations can be created in the wake of an initial workgroup computing implementation. It is important to temper those expectations by making it clear from the beginning that a checklist of procedures must be followed for each new implementation.

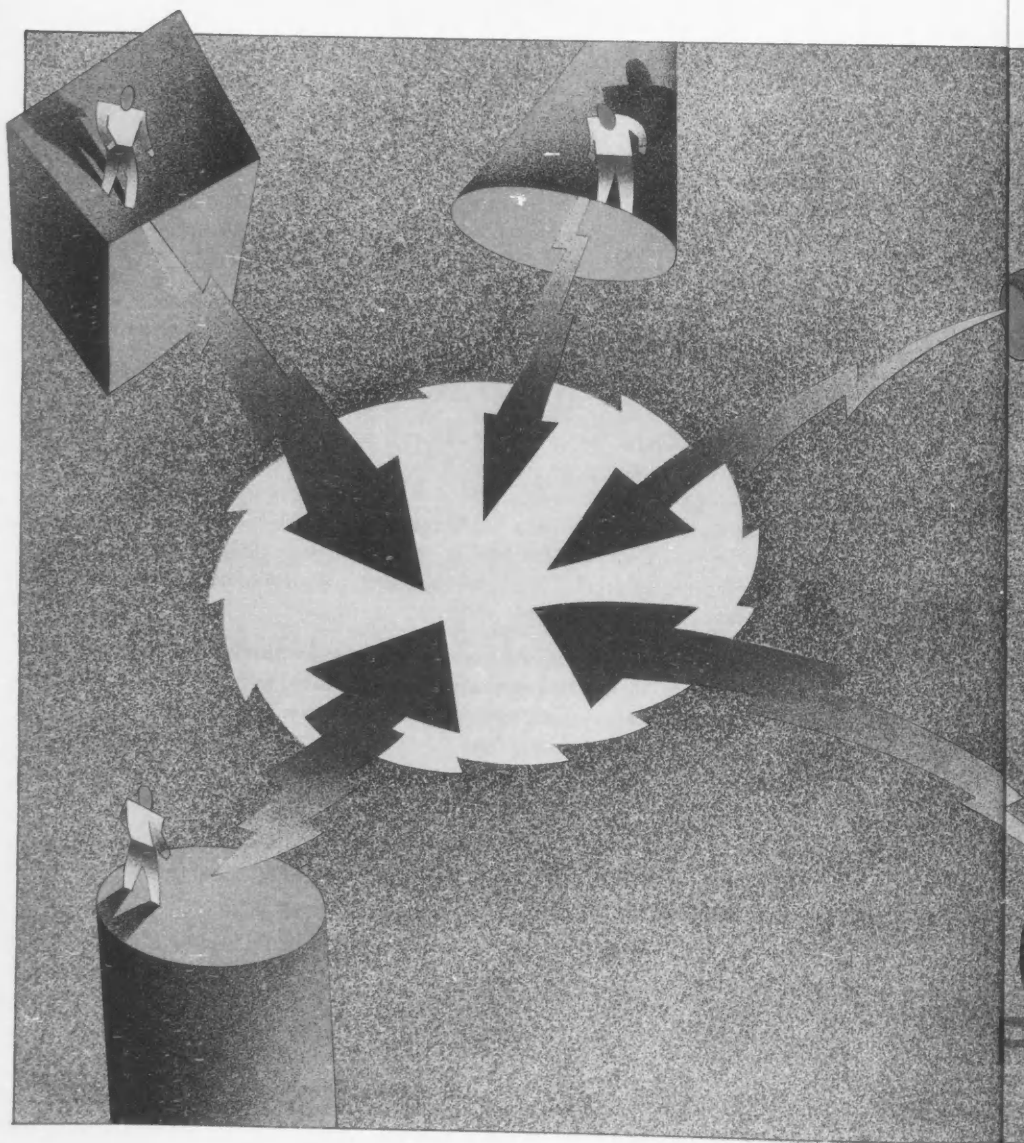
Especially in its early stages, workgroup computing is a fragile process. If business objectives are not properly defined, if the workgroup team does not reflect a balance of technological strengths, or if the scope of a project is misjudged, the result can be failure.

Such failures will be few and far between for users who take the time to implement workgroup systems properly.

This White Paper was written independently of the *Computerworld* editorial department by Ann Palermo, Director of Workgroup and Messaging Research, at International Data Corporation.

For more information on the content of this White Paper, or for information on International Data Corporation, please call 508-872-8200. For more information on the White Paper Program, please call 508-879-0700.

IDC White Paper





WORKGROUP TECHNOLOGY: TYING TECHNOLOGY TO BUSINESS OBJECTIVES

IT IS OFTEN STATED THAT OPEN SYSTEMS AND STANDARD PLATFORMS WILL SHAPE COMPUTING IN THE '90s. THIS MAY BE SO, BUT THE SINGLE COMPUTING DISCIPLINE THAT WILL BRING THE BIGGEST REWARDS TO USERS IN THE '90s WILL BE WORKGROUP COMPUTING. ■ THIS IS BECAUSE WORKGROUP COMPUTING IS NOT DEFINED BY

AN OPERATING SYSTEM, A
HARDWARE PLATFORM OR
AN INTERNATIONAL STANDARD. WORKGROUP COMPUTING SHOWCASES WHAT THE BEST COMPANIES DO BEST — RUN THEIR BUSINESSES AND KEEP THEIR CUSTOMERS SATISFIED. ■ WORKGROUP COMPUTING IS NOT A FRINGE CONCEPT, BUT A PIVOTAL COMPUTING APPROACH

THAT HAS THE POTENTIAL, WHEN WELL APPLIED, TO PROVIDE A DISTINCT COMPETITIVE EDGE. IN THE '90s AND BEYOND, WORKGROUP COMPUTING WILL HAVE AN IMPACT ON CORPORATIONS WELL BEYOND THE PC SOFTWARE REVOLUTION OF THE '80s. THE TELLING DIFFERENCE WILL BE IN ITS TIES TO THE DETAILS OF DOING BUSINESS,

IDC White Paper

its directly quantifiable business benefits, and the impact it has on the way people work together to realize these benefits.

What exactly is workgroup computing? Workgroup computing does not have strict boundaries or a crisp definition. It is, rather, a concept that fills the chasm between personal productivity applications and enterprise-wide solutions. Successful workgroup computing addresses needs previously ignored by computer technology.

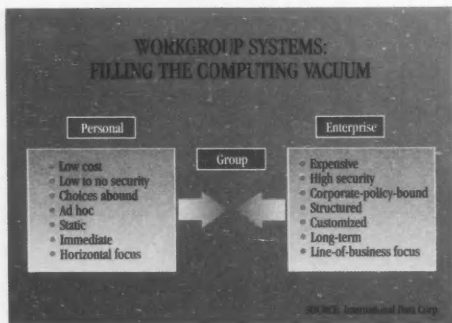
More and more, companies are gaining clear business benefits by mapping technology directly to detailed business processes. Packaged solutions are beneficial to a point, and that point will put a company on a par with any other business that has purchased that same solution. Therefore, the greatest business benefits are reaped by tailoring tasks and processes to the unique way companies conduct their business.

AUGMENTING CURRENT TECHNOLOGY

Enterprise computing solutions were the drivers behind the wide-scale adoption of computer systems through the '60s and '70s. These systems offered greater organization, more immediate access, more versatile information retrieval options and faster processing.

The '80s brought with them personal productivity applications that dramatically changed the way individuals approached their work. Painstaking calculations, labored crafting of prose and hand-drawn graphics quickly were adapted to more automated and productive results with spreadsheets and word processors. Users worked at their own pace, with their own choice of the most appropriate tool.

Workgroup computing is not designed to displace current technology investments, but to augment them and allow users to automate previously manual functions. For example, workgroup computing is designed to work on decentralized LANs, tying together loosely organized groups of people, and allowing them to work together more effectively. It is used for sharing information, helping people to track their work and to collaborate on team management projects.



There is a spectrum of group computing products on the market. These products vary from personal productivity, out-of-the-box "groupware" (e.g., ON Technologies' products), to more enterprise-wide business-tailored workgroup systems environments, like Lotus Notes.

Quickly and with little training, workgroup products get groups of people up and running on simple applications that require cooperative work. For example, on the low end, collaborative authoring among members of an editorial staff lends itself to a low-cost, high-productivity group tool.

At the high-end, with what IDC calls workgroup computing systems, product requirements focus more on business issues. For example, tracking the flow of work through a customer service organization.

One of the most appealing elements of workgroup computing is that the cost and resources needed to deploy a workgroup system are quite small. However, it would be a great mistake for a user to simply buy an off-the-shelf package and believe it will make a significant business contribution. This is because one of workgroup computing's biggest benefits is the knowledge gained from analyzing business processes, the first step in implementing a workgroup system.

KEY FEATURES

How then, are we to recognize a workgroup system and compare one to another? There are some key features that any good workgroup system should include:

Ease of Use

A simple axiom differentiates work-

group computing from personal productivity applications: to be successful, everyone in the group must use it. Thus, the process must be made more intuitive to the user. This includes shielding the user from such things as host interfaces and computer languages. In some cases, it may mean automatically sublaunching transparent applications.

Scalability

People in workgroups usually work in the same building or group of buildings. Increasingly, however, workgroups are spread across remote locations, and even different companies. The more sophisticated workgroup systems generally have an underlying database. A key product selection criterion is the degree to which the underlying database can be effectively distributed and updated in a timely fashion.

Security

Security is generally defined by the user. Features may include view-only, editing rights, create rights, approval/denial rights, access to all or only a portion of the document, and management reporting information access. Security rights may extend to the right to know whether or not a file even exists in the system.

Heterogeneous Support

The variety of individual user requirements precludes the use of only one desktop device or operating environment. For example, a PC user may simply require access to the workgroup application and some other PC software. In contrast, a heavy user that requires terminal windows, application windows, database windows and workgroup application windows will likely need a multi-threaded operating environment. This will become more and more a requirement. Further, because of the realities of current network installations, particularly across multiple sites, support of several LAN operating systems is required.

Open Access to Other Data and Information

One of the greatest advantages of workgroup systems is their ability to ac-

Workgroup Technology: Tying Technology to Business Objectives

cess information outside the normal user domain. Access to internal and external databases, with full import and export facilities, is part and parcel of many workgroup solutions.

Customization

Effective workgroup systems must be customizable by at least two groups: end users and application programmers. This ensures that the people who know the business best can effect full-blown applications. Application developers can transcend individual application development efforts. This means developers can build a baseline application, which can then be leveraged by multiple user-driven application efforts. For end users, a graphical environment is a requirement.

WORKING WITH IS TO IMPLEMENT WORKGROUP COMPUTING

Another major benefit of workgroup computing is that, in many companies, it may be the first application jointly initiated by IS and line-of-business managers.

Traditionally, the adoption of new technology involved a top-down approach. Central IS was the gatekeeper of new technology, and commonly the first user. It was only as technology became less expensive that it filtered down to lower levels of the organization.

Most companies have recognized that they can no longer afford this approach. They want to apply discrete technology to specific business problems as quickly as possible. This is particularly true of workgroup applications.

For workgroup applications, the department, group or line-of-business manager is commonly the cornerstone of the application content. He or she knows the details of the specific business process and is in a position to analyze that process, recommend changes and evaluate the results.

This cannot be done in a vacuum, however, as many workgroup applications will test the limits of the technology infrastructure, which is maintained by IS. IS must be intimately involved with the deployment of workgroup applications to ensure that the corporate technology infrastructure can balance their requirements.

Frequently, after the first successful workgroup application, the number of follow-on applications grows quickly,

limited only by user imaginations and the IS-supported technology. Empowering the user does not mean less responsibility for IS, it means giving the user the tools and resources to do more. Particularly in the case of networked applications, this will entail extensive support from IS.

It may look as though this is just more work for IS, while the laurels go to the business manager. However, a broader view must be taken. Involvement in the deployment of workgroup applications should be considered an opportunity for IS to become a more critical team member, and to better understand specific business practices.

IMPLEMENTATION CHECKLIST

Workgroup computing will impact businesses in a way office automation never could — quantifiably. There will be no gains to quantify, however, without a proper amount of planning and preparation. IDC believes workgroup computing should be implemented through a series of sequential steps.

Define Business Objectives

The first cut at defining business objectives should be kept general in nature. Try not to wade into specific details. For example, one objective could be improvement in the productivity of sales support personnel. Another could be improved customer service as a result of making internal information available with faster document development. By staying at a general level, users can list the benefits or problems without any particular product in mind.

Once the initial goals are set, the next step is deciding which objectives are tactical and which are strategic. This is important because strategic issues are more likely to require significant customization of workgroup packages, while tactical objectives may be realized with little to no customization.

Having taken these initial steps, users will have already gained some insight into what kind of workgroup product is best for them and the resources they will have to allocate.

THE SPECTRUM OF GROUP COMPUTING

Groupware application	Workgroup system
• Out of the box	• Customized, API's available
• Low investment, replicable	• Higher investment in existing business process analysis
• Low security	• Resistance to high security
• Single platform, small	• Easy to be dispersed, even multi-company organizations, Virtual Teams
• Single domain, limited growth	• Scalability, scalable
• Easy to use	• Easy to use and learn
• Standard applications	• Open access to other data, external information
• No security, price, control	• Customizable and control during cross-domain enterprise collaboration
• Possible future integration	• Reduced e-mailing, accessing, longer term
• Reproducible, a few, specific, vertical solutions	• Reusable, tailored to business application or subset of the business
• Possible services, maintenance	• Integrated, continuous support

Source: Forrester Research, Inc.

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—Jim Seymour, PC WEEK

Lotus Notes

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ivity are taking Notes.



Case Study: CMS Helps AT&T Develop Proposals

The Proposal Development Engineering Department of AT&T is faced with a common business problem — submitting bids to the U.S. Government. This involves a very strict set of requirements. It also involves meeting stringent deadlines. A proposal that misses a deadline will not be accepted.

According to Jeanne Cooke, network administrator in AT&T's Proposal Development Engineering Department, "If we are one minute late with our proposal, it will not be considered. So our deadlines are for real, and that makes for a very intense work environment." In that environment, Cooke and her colleagues are always trying to work more quickly and efficiently toward the goals of putting out the best proposal at the lowest internal cost.

Since establishing a publishing resource center and adding the Change Management System (CMS) document management system from Workgroup Technologies, Inc., they are finding it much easier to meet those goals.

CMS

Proposals are written by technical writers from Bell Labs who are sent to the publishing resource center for 90 days and assigned a section or several sections of a proposal. They write on PCs with the word processing software of their choice. They then export their work into ASCII files, sketch out the necessary graphics and give them to illustrators. The

illustrators then draw all the graphics and export them into Framemaker. At the same time, the page make-up artists also import the ASCII text into Framemaker, bringing text and graphics together to makeready for printing.

Since few proposals are designed from scratch and time is of the essence, writers frequently seek access to previous proposals and other sections of the proposal they are currently working on.

"If ever there was a competitive advantage in time-sensitive publishing, it's got to be this. We could never go back to the old way. We haven't missed any deadlines since we got the system."

— Jeanne Cooke
Network Administrator, AT&T

Avoiding a Ground-Up Approach

"It's as though you wanted to update your resume, and you had a book of resumes to look through for new styles and formats until you found the one that suited your need," Cooke says. "That's what we wanted to do with proposals. Proposals are tricky because they are not static and they are not general. Only the most general of forms

will apply from one to the next."

Change control was a major problem for the department. A number of unsatisfactory approaches were taken before CMS was installed. For example, every time a sketch or a request for a "make-from" arrived, it was first assigned a new control number. Also noted was who assigned it, who received it and the date it came in. The assignment was then passed off to the illustrator, who drew it and pasted it onto a printed page. All changes were made manually. This process took far too long and could not be easily controlled.

Select the First Pilot Carefully

Users need not restrict themselves to just one application; in fact, many successful workgroup application pilots have automated two activities simultaneously. If there are four or five business problems to be solved tactically, it is wise to start with an off-the-shelf product before launching into a more resource-intensive customized development effort.

However, if only one of the problems can be solved with an off-the-shelf product, the experience gained by implementing it will not prepare the user to address remaining or follow-up problems.

An issue to consider in this scenario is what IDC calls the "killer success factor". This theory is based on the premise that

success can be a bigger killer than failure. It comes into play after a user experiences initial success with an off-the-shelf product. At that point, there is a great deal of pressure on that user to implement a more complicated, strategic workgroup project without the benefit of a pilot. These high expectations may be difficult or impossible to meet.

In order to avoid this scenario, select a vital application with strong user support for the initial workgroup implementation. Set realistic expectations on the part of users and require reasonable resources from management.

Assemble the Team

Having determined the first applica-

tion or applications, the next step is to assemble the implementation team. Try to achieve a balance of backgrounds so that no one discipline overwhelms the team. It could be argued that if an off-the-shelf product is used, a team is not necessary. However, it should be noted that capturing knowledge of the process may be a measure of success, and this can be better done with multiple people involved. In addition, workgroup computing by definition is a team event, so the sooner a team is formed, the faster benefits will be derived from the project.

Workgroup applications are generally group or department oriented, but IS should be involved in their implementation processes.

Workgroup Technology: Tying Technology to Business Objectives

Implementing With Care

Two years ago, due to the near chaos of the old system, a decision was made to automate the proposal publishing process. But the changes had to be implemented carefully. According to Winston Hodges, department supervisor, "If you're going to turn a product loose on technical writers who are only going to be down here for 90 days, you have to have your act together. It needs to be pretty simple."

AT&T had to do a cost justification for CMS. As part of that effort, the proposal center developed a baseline from which it could measure improvements. That was difficult without any automated means to gather data. Now, however, CMS gathers its own metrics.

Once CMS was chosen, the department began automating functions one at a time. Since the labor-intensive graphics are the most expensive part of producing a proposal, they were automated first.

Illustrators are responsible for the most changes in the production process. When they receive a new drawing, or a "make-from", they assign it a control number and add it to the system. They organize their work by setting up classes. Each proposal is considered to be a class. Each class contains volumes, e.g. management volumes, technical volumes and summary volumes.

Tracking Previous Versions

In the course of their work, illustrators check out drawings for changes, and then check them back into the system. Anyone working with the proposal can determine the exact status of every illustration at all times. CMS also automatically tracks previous versions, any of which can also be accessed at any time.

Initially, there was resistance to the new system, particularly among the illustrators, who thought the system required extra clerical work that shouldn't be part of their jobs. They changed their minds, however, when the system went down and they had to revert to the old manual process. Their sup-

port for the new system grew even stronger when a proposal that had been done just prior to installing the new system came back for additional work. The proposal was so unorganized the illustrators had to redraw a number of the graphics in it.

Users Want More

The success of the system has made users hungry for more. The proposal department would like a simpler user interface to accommodate not only the illustrators, who are technically savvy, but also managers, who will never open a manual, and writers, who are only on location for a short time.

In addition, the management reports need to be improved — a common need among many Structured Query Language database-driven products. There is also a need for more platform support, particularly for Macintoshes and PCs running Windows.

AT&T believes the automated system will become even more important to the technical documentation specialists because the U.S. Government's Computer-Aided Logistics Support (CALS) initiative specifying technology standards for government contracts has a database-document management portion.

Finally, the department is actively investigating developing its proposal catalog, so that all best-of-class proposals — which cover various formats that recur from proposal to proposal such as manufacturing facility capabilities — can be easily accessible to the writers.

AT&T has some succinct advice for prospective users of workgroup systems: do as much planning up front as possible and evaluate the software by getting an actual copy and trying it out.

"If ever there was a competitive advantage in time sensitive publishing, it's got to be this," says Cooke. "We could never go back to the old way. We haven't missed any deadlines since we got the system."

Evaluate the Scope

There are several questions to ask here: Is the project best served by a pilot? Is the group small enough? Is the group motivated? This is also the point when the user puts boundaries around the project, boundaries that can not be violated.

Group size is critical. In a Fortune 100 company, a 150-person group might make a pilot workable, while for a smaller company, a six-person group may be more appropriate.

The amount of resources available is also critical. Is there a full-time LAN administrator who has time to delve into the application layer? Or will the user depend on an overworked IS staff member?

Finally, and most importantly, is there

an established LAN and are there wide area communication links to remote offices?

On the organizational side, consider the common work done by members of the targeted project group and their computing experience. If everyone performs the same type of task and has similar amounts of computing experience, training and implementation is easier. It is more likely that a diversity of tasks will be represented.

Make sure that the application selected for workgroup computing has some degree of replicability, thereby ensuring a quicker learning curve. It is also important to ensure that the knowledge gained in this process remains within the compa-

ny and does not walk out the door with a consultant.

Quantify the Benefits

Even though some benefits are very difficult to quantify, it is necessary to provide some measure of financial return in both hard and soft dollars. On the soft-dollar side, include the knowledge gained through the implementation process because individuals that acquire this knowledge will have a higher corporate value.

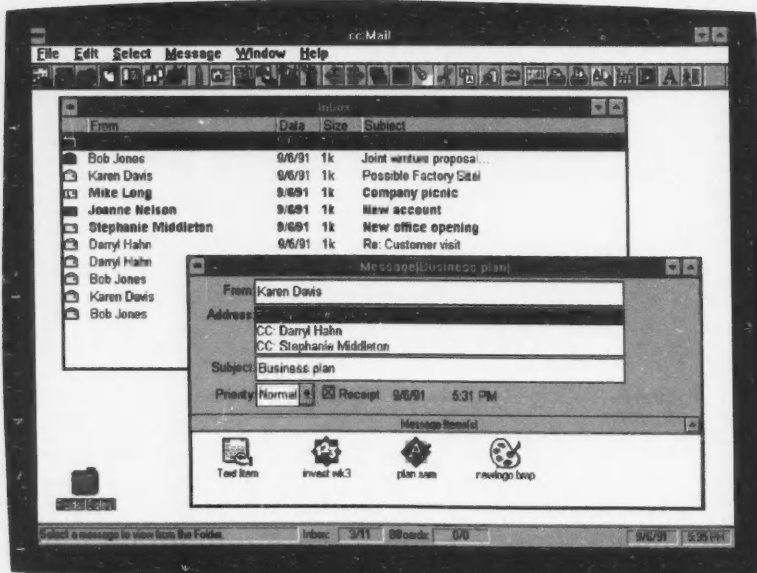
It is important to measure some baseline information before the workgroup project is implemented. Such information may include the time required to complete documents and respond to cus-

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cc:Mail is so easy to install, learn and use, you can have your electronic mail system up and running quickly.



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It's easy to see why cc:Mail™ from Lotus® is the world's leading electronic mail package. Because it delivers more than messages. It handles just about any electronic mail need you might have. No matter how large or small your workgroup is. With it you can send text, files, graphics and faxes across all major local area networks such as Novell®, LAN Manager and Banyan®. Without needing new hardware.

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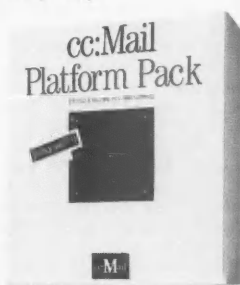
Our newly released cc:Mail for Windows takes full advantage of Windows

3.0. Support of Dynamic Data Exchange lets you easily send other mail-enabled Windows files from within those applications. For example, you can send a report you've written with Ami Pro™ for Windows across the country while the application is still on your desk top.

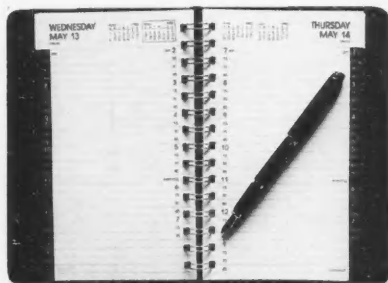
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IDC White Paper

tomers inquiries. It may also include the number of requests for support information from customers or salespeople over a given period.

Soft-dollar savings also include improved morale, the ability to accomplish cross-training of individuals, improved communication and greater access to information. The soft-dollar factors are generally best measured through employee surveys.

Generally, if users are spending 25% of their time either looking for information or accessing it, a workgroup automation application can be cost-justified.

Process Analysis

The first step in the process analysis is building a series of charts. The first chart should describe the basic overall activities to be accomplished. A second chart should describe the same process, but be based on a best-case, least-complex approach. The third chart should describe a worst-case scenario. Each chart is then placed through the same task-analysis process.

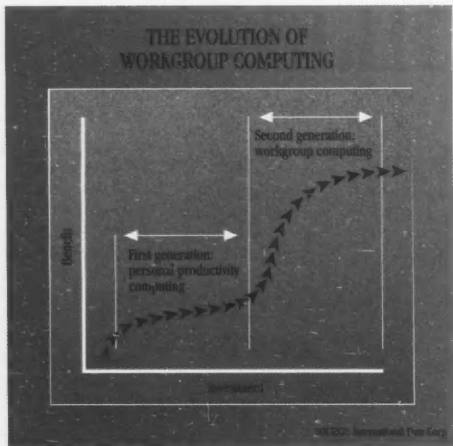
This involves taking each step in the chart and breaking it into a series of tasks. Wherever feasible, determine how many users are required to complete each of the tasks. The idea behind this process is to identify the commonality of tasks being performed by workers so that the proper workgroup software can be selected.

Reformulating the Process

One of the significant benefits of workgroup computing is the greater understanding that is gained of the business system being automated. Shining a new light on old systems frequently results in tremendous benefits.

Unless a process analysis is completed down to the task level, the concept of re-engineering, or reformulating — a term IDC prefers, since few business systems were engineered in the first place — cannot be accomplished.

This process requires that common tasks be identified and the workers who perform them be interviewed. The pur-



The benefits of personal productivity and workgroup computing are growing as more resources are invested in them.

pose of these interviews is to determine the value of steps involved in the tasks.

This is one stage of the process where consultants can be very valuable. Good ones are objective, have excellent analytical skills (particularly if the project is well-contained), and can gain insight into how the process actually takes place as opposed to how company management thinks it happens.

Systems Analysis

In order to avoid acrimony between users who want more features, and IS, which must contain user demands, functional requirements can be generated by the process/task analysis approach. Using this process, both users and IS can see the functions that are needed as opposed to those that are not. The team can then determine the cost and time to provide a baseline product, as well as the incremental cost of adding other features and functions.

The Buy-In

Although up to now very few workgroup systems have stemmed from a formal Request for Proposal (RFP), going through a streamlined proposal request process is very helpful, even if the RFP is never issued. Such proposals enforce structure and discipline on the group.

Most importantly, they ensure that there is an internal management buy-in, and that everyone else involved also signs off. Without this process, people can end up feeling that they had no input into the final decision.

Another benefit of issuing an RFP is that it sets a deadline for information gathering. Without deadlines, the process can degenerate into a series of undirected meetings with no conclusions.

Vendor Selection

The decision on whether to work with a systems vendor, software vendor, systems integrator, VAR, and/or a consulting organization is influenced by a number of factors. One is whether workgroup computing will be used from a strategic or

tactical perspective. Others include the availability of internal resources, the nature and scope of the first application, the current automation environment, the future automation architecture, the future application automation plans and the anticipated internal growth rate of workgroup technology.

For those companies with very limited internal resources that see the need for simple tactical solutions, some combination of consulting and VAR relationships is best. For those taking a strategic tack and expecting a high rate of growth, a software or systems vendor will make the best partner.

System Implementation

A schedule of activities that will have to be addressed during implementation includes:

- Application design
- Pilot
- Training
- System testing
- User acceptance testing
- Feature and function review
- Final application development
- Pilot number 2
- Second round of training
- User acceptance retesting
- Support
- Sign-off to the vendor

Case Study: Dell Uses Notes at Home and Abroad

Efficient communication is more than a priority at Dell Computer Corp., it is a way of business life, and has been since the company's founding. Based in Austin, Texas, Dell designs, manufactures, sells, services and supports all types of personal computers.

To meet its diverse communication needs, Dell relies on Lotus Notes, a document-oriented database used for building applications that enable workgroup communications and information sharing.

Notes was first implemented at Dell in mid-1990 when the company committed to 200 licenses.

Initially, the software was used to create an issues database for Dell software development projects. Dale Reynolds, Dell's vice president of product development, was so impressed with Notes' ability as a collaborative platform for sharing software development ideas, that he moved quickly to establish an issues database for the company's hardware projects as well.

"Notes offered immediate benefits.

*Users received information quickly,
instead of having to wait a week.*

*Notes also made collaborating on an
issue easy and efficient."*

—Paul Guinn,
Dell's Notes Project Manager

Using "Core Teams"

Dell develops products through "core teams" that include representatives from all relevant areas of the company. These teams share information about issues affecting their products — anything from technical problems and difficulties with suppliers, to scheduling questions and international concerns. Prior to Notes, information on issues was communicated both through paper reports and weekly updates.

"Notes offered immediate benefits," says Paul Guinn, Dell's Notes project manager. "Users shared information quickly instead of having to wait a week, which can be an eternity in product development. Notes also made collaborating on an issue easy and efficient by formalizing message issue and response activity. And the flexibility of Notes' data views made it easy to track open issues at a glance."

With both hardware and software development teams using Notes to share and discuss issues of concern, Dell quickly discovered another important feature of the software — its ability to stimulate users' creativity. According to

Guinn, "Notes is extremely user-driven. There's a serendipity about it. Users set out to do one thing with it and wind up discovering 20 new uses." Some of those new uses have been translated into critical applications. They include:

NotesBooks — Each database ("book") contains all the information relevant to a single project or a group of Dell hardware or software initiatives. NotesBooks centralize project concepts, market requirements, specifications, schematic designs, testing information, reports, engineering changes, schedules, risk analyses, job descriptions and other project information. They not only allow project teams to share this vital information instantly, but also represent an invaluable resource for Dell's Current Systems Group, which "owns" all Dell products from the time of shipment to the end of their product life.

Product Plan — This database contains brief descriptions of all Dell development projects, as well as anticipated schedules and a list of project managers. It improves Dell's strategic planning by disseminating this information instantly among senior management and fostering group discussion whenever issues arise. Prior to Notes, senior management received this information monthly via paper reports that were often already outdated, especially for Dell's international business units.

Implemented in stages at Dell headquarters, Notes became available to the firm's international business units in September, 1991. The addition of these international licenses brought the total number of Notes users at Dell to 725, about 625 of whom work at the company's headquarters.

Dell has taken a creative multi-level approach to meeting its communication needs. "People often take a myopic view of technology," explains Reynolds. "When we first introduced Notes, many people couldn't understand why we were upgrading to 386 PCs to accommodate it. But once they spent thirty minutes with a Notes database, their eyes lit up and they asked where we'd been hiding the system. Notes causes people to experiment, which has brought about a real culture change in our organization."

POST IMPLEMENTATION ANALYSIS

After implementation, wait two or three months and then analyze the project. Start by determining whether or not the anticipated benefits from the system

are being realized, and make sure results are documented. The next step is to review the overall implementation process to determine how it could be improved. Team members should continue to meet

and assess the workgroup system.

Remember, the project is never over until you say it is over.

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It's true that results are always better when people work together. And for people who work with software everyday, it's become even more critical that their applications work together, too.

Whether you work with numbers, words, pictures or messages, each of our products gives you all the compatibility and integration you need to work together more productively.

And with our five full-fledged Windows™ applications (1-2-3®, Lotus Notes®, cc:Mail™, Ami Pro™ word processing and Freelance Graphics™) everything on your desktop can work together, too. What's more, we've led the way in groupware with

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Compaq Deskpro 486/33L: Superb but costly

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Suzanne Weizel.

Reviewers of Compaq Computer Corp.'s Deskpro 486/33L workstation alternately praise it as the fastest, highest quality system and criticize the company for offering it at the highest price.

Performance: Quality subsystems and first-class engineering give the Deskpro 486/33L superb performance. Optional drive arrays speed access and provide data integrity when the system is used as a server.

Ease of use: Well-planned design makes setup and configuration a breeze. Drive bays can be accessed from the front or back. The on/off switch is on the front panel.

Design: The 486/33L leaves lots of room to expand. It comes with an Industry Standard Architecture enhanced small device interface controller, a system board with a 128K-byte processor cache and a high-speed, high-resolution video controller.

Service and support: Limited at best, reviewers said. Service varies from dealer to dealer.

Value: For high-end applications on the desktop, the Deskpro 486/33L delivers quality and reliability. List prices start at \$8,999 for the Model 120. A Model 650 costs \$11,599.

Compaq's Deskpro 486/33L

Reviews	Performance	Ease of use	Design	Service and support	Value	Overall
Byte 5/91	Good	Very easy to set up and configure	Quality construction	Reliable operation	Most expensive by far	Top dollar brings top quality
PC Magazine 4/16/91	Shines in field of fast machines	Simple upgrade process	Excellent overall design	Dealer service varies	Priced higher than most small cars	Ideal, high-end computer
PC World 3/91	Excellent	Excellent expandability	Excellent	Fair	Excellent	Best buy
Users						
Dick Schell, The Turner Corp.	■	■	■	■	■	High quality, high price
Fredrick Zickert, Eaton Corp.	■	■	■	■	■	Total upgradability
Analysts						
Jerry Caron, Faulkner Technical Reports	■	■	■	■	■	Tremendous performance; pricey
John Dunlap, Workgroup Technologies, Inc.	■	■	■	■	■	Too expensive; excellent engineering
George Thompson, Datapro Information Services Group	■	■	■	■	■	Very responsive, good graphics
Phil Magney, ARS, Inc./Workstation Laboratories	■	■	■	NC	■	Good but expensive

Key: ■ Very good ■ Good ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Joe McGlone, McGlone & Co.	■	■
Jim Poyner, Rauscher Pierce Lefines	■	■

Compaq reported 1991 revenue of \$3.3 billion, a 9% decrease, and net income of \$131 million, a 71% decrease.

Compaq responds

Mike Berman, representative:

Service and support: We now offer a toll-free number for direct technical support. There are fee-based services available.

Value: We have reduced our prices considerably over the past six months. There may still be a perception of high cost, but we are very competitively priced.

Dell Powerline 433SE: Packs a powerful punch

Dell's Powerline 433SE

Reviews	Performance	Ease of use	Design	Service and support	Value	Overall
Infoworld 8/19/91	Excellent	Excellent compatibility, expandability	Very good	Excellent	Excellent	9.3*
PC Magazine 3/17/91	Stellar	Easy setup	Technologically advanced	Good	Good	Good price/performance
Users						
Paul James, Hebb & Gillin	■	■	■	■	■	No compatibility problems
Neil Peckham, Channel Computing, Inc.	■	■	■	■	■	Poses problems with OS/2
Fredrick Zickert, Eaton Corp.	■	■	■	■	■	Internal design causes problems
Ed Wilt, WHDH-TV	■	■	■	■	■	Top price/performance
Analysts						
John Dunlap, Workgroup Technologies, Inc.	■	■	■	■	■	Great performance
Phil Magney, ARS, Inc./Workstation Laboratories	■	■	■	■	■	Nice expansion options
Jerry Caron, Faulkner Technical Reports	■	■	■	■	■	Excellent value

Key: ■ Very good ■ Good ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. *Infoworld ratings based on a 1-to-10 scale.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Brian Fernandez, Catalyst Associates	■	■
David Guthrie, Morgan Keegan	■	■

Dell reported 1991 revenue of \$546.2 million. Revenue for the first nine months of fiscal year 1992 was \$604.1 million.

Dell responds

Martin Seyer, a director of product marketing:

Performance: We have no compatibility problems with OS/2. We do a significant amount of testing to ensure 100% compatibility.

Ease of use: When a user needs to access the system or memory boards, we recommend removing the drive array controller board. It takes less than two minutes and provides access to the boards.

Dell Computer Corp.'s Powerline 433SE is a powerful server available at a desktop price.

Performance: Quality workmanship, 32-bit Extended Industry Standard Architecture and the 33-MHz Intel Corp. i486 microprocessor add up to impressive speed. The optional six-drive array boosts internal storage capacity to 1.2G bytes, increasing throughput significantly. Some users reported compatibility problems with packages such as OS/2 because of Dell's own internal designs, but the system is certified with Novell, Inc.'s NetWare.

Ease of use: Setup is fairly simple, although the drive array must be removed to access the memory and processor cards. There is a recessed reset button, switch-status LCD and a power switch on the front panel.

Design: The full-size tower case has loads of room for expansion. There are 11 half-height drive bays, three of which are exposed.

Service and support: Dell offers an impressive one-year warranty with free on-site service, a 30-day money-back guarantee, a 24-hour toll-free support line and fax services.

Value: Designed specifically as a server, the Powerline 433SE boasts impressive performance at a competitive price. The base system lists for \$6,199. A 16M-byte system lists for \$12,949.


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CONTRAST
SUMMARY
    Clinical Trial Data
    General Linear Model Procedure
    Requested Measures Analysis of Variance
    Analysis of Variance of Contrast Variables

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WORKGROUP COMPUTING

LANs • SERVERS • SOFTWARE FOR GROUPS

Charting the market research waters

Joint effort yields software that melds databases

BY MARYFRAN JOHNSON
CW STAFF

Market research used to mean thousands of phone calls and tedious hours of analysis at Castillo Co. in Phoenix, a real estate consulting firm that specializes in corporate acquisitions.

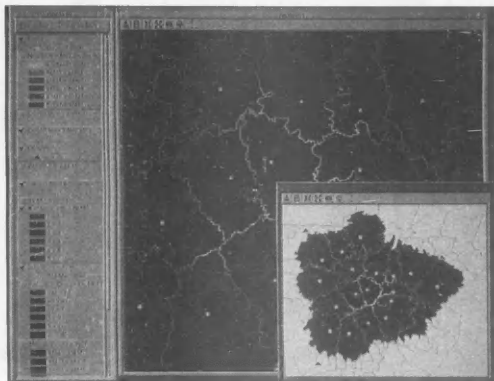
"We've done market studies for some clients that called for 3,000 phone calls," said Stephen Boege, MIS director at Castillo, which counts firms such as State Farm Insurance Co. among its clients. "Now we're using a different approach, and it's a much more cost-effective one."

That approach hinges on the processing power of a Unix-based workstation running a new data package called ArcCity — the first result of a 5-month-old

alliance between Equifax National Decisions Systems (NDS) and Environmental System Research Institute (ESRI) in Redlands, Calif.

Equifax NDS, based in Encinitas, Calif., is a leading provider of demographic, business and consumer-related data, offering more than 65 varieties of databases on everything from U.S. census data and shopping center locations to major roads and highways. ESRI is a leader in geographic information systems (GIS) software with its flagship ARC/INFO product, which manages, analyzes and displays geographic data.

The marriage of these two industry heavyweights gave Castillo an early tour of a new market niche called Marketing



Equifax's ArcCity combines ready-made data with mapping and data analysis capabilities for easy market research

Geographic Information Systems. It also set the stage for businesses of all sizes to combine

ready-made, preformatted data sets with sophisticated mapping and data analysis capabilities.

"For the kind of work we do, ArcCity is wonderful. If I had to gather all the data in native form and then convert it, it would be too time-consuming," said Boege, who runs the software on a Sun Microsystems, Inc. SPARCstation 2 workstation.

The ArcCity package — tailored for use with ARC/INFO and ArcView software — includes an array of data such as census information, business and employment counts and retail expenditure potential for any metropolitan area in the U.S.

Ease of use

"The major benefit of ArcCity is that the data is in the same format for every city," Boege noted. "If we've got a project analyzing property in L.A. County and then we move on to a different location like Kansas City, we can run the analysis without changing much of anything. We just plug in new data, do a little bit of reprogramming and run the analysis again."

For example, Castillo used the ArcCity software to analyze potential new locations for Standard Brands Paint Co. stores. "We were able to find voids where they were not covering the territory, and we could map out and prioritize those sites for them," Boege said.

In forming their strategic partnership last October, ESRI and Equifax NDS agreed to start with ArcCity, which is sold directly by Equifax, and then expand into a set of vertical applications customized for particular industries. The ARC/INFO applications run on a wide range of machines, from proprietary mid-range systems and Unix workstations to personal computers

Continued on page 60

Analog offers lower cost multimedia approach

BY JOANIE M. WEXLER
CW STAFF

NORWOOD, Mass. — Chip maker Analog Devices, Inc. has begun to leverage processor technology to inexpensively deliver multimedia applications to existing narrow-band local-area networks as well as personal computers.

The company's recently announced multiple-application "signal processors" will be com-

bined with software from third parties and marketed to computer makers for bundling with their machines.

The approach diverges from emerging broadband communications-oriented mechanisms for multimedia, such as Fiber Distributed Data Interface-2 (FDDI-2) or local Asynchronous Transfer Mode networks. Analog Devices' scheme uses processing power and compression techniques to minimize band-

width requirements for transmitting data, voice, sound and image rather than relying on the ultrahigh speeds of next-generation LANs.

An Analog Devices chip set that integrates several applications starts at \$25, while the single-application circuit boards available today reportedly cost \$200 and up, company officials said. Currently, signal processing technologies are fixed to a single application embedded in read-only memory, requiring users to purchase multiple boards for multiple applications.

Analog Devices noted that its digital signal-processing chip resolves the timing issues necessary to deliver the likes of real-

time voice and video, which cannot tolerate the unpredictable delays that data can. This isochronous requirement is also accommodated in tomorrow's FDDI-2 and Asynchronous Transfer Mode networking.

This month, the firm introduced a \$25 fax/data modem chip set using software from Milpitas, Calif.-based Digicom Systems, Inc. The same chip set reportedly can execute modem command sets, data compression, error control and sound and speech algorithms. This would allow manufacturers to offer multiple capabilities from the same silicon platform.

Resulting desktop applica-

Continued on page 64

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By the end of this week Computerworld readers will have spent over \$20.2 Billion on Information Technology this year — representing nearly half of all IT spending to date in 1992.

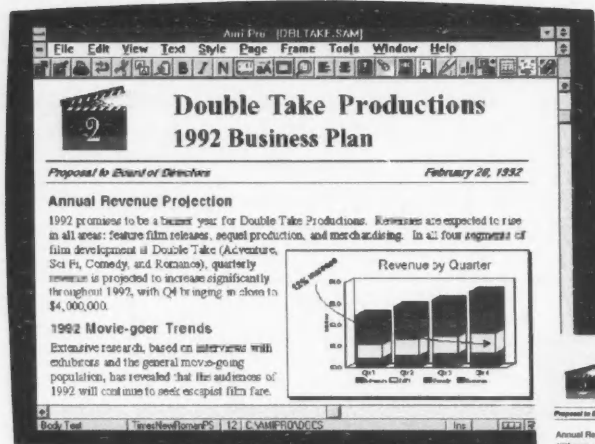
COMPUTERWORLD

The Newsmagazine of IS

Source: IUG Research Services, Fall 1991

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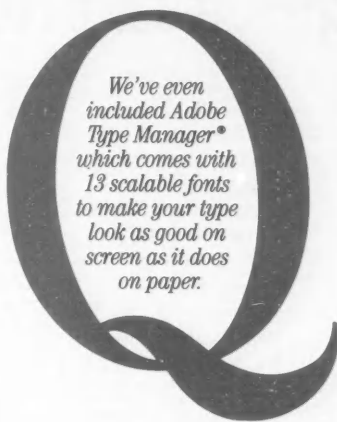
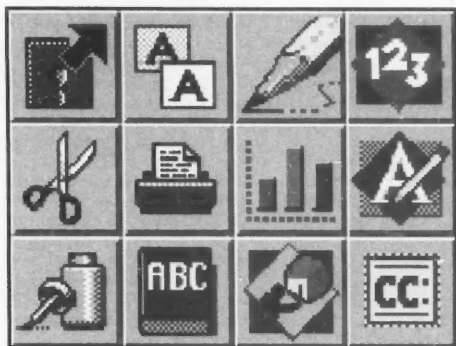
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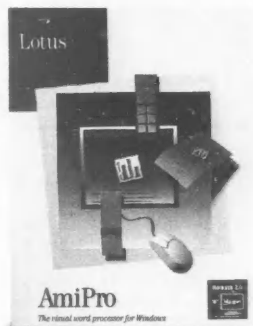
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—PC Magazine 11/12/91

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AIX database stuck in lab; users express little concern

BY JEAN S. BOZMAN
CW STAFF

Two years after a statement of intent that it would supply a relational database for the RISC System/6000's AIX operating system, IBM is still trying to get it out of the laboratory and into customers' hands. Although IBM has stopped short of saying when the database will be available, industry analysts say they believe it will be announced later this year, with a 1993 ship date.

Last fall, the slow-moving project was shifted to IBM's software laboratory in Toronto, and a new manager was hired in December.

Although users surveyed recently indicated little interest in the database, its delivery is important to IBM because it would fulfill the firm's stated goal of getting AIX systems and Systems Application Architecture (SAA) systems to interoperate [CW, March 11, 1991]. Janet Perna, director of database technology at the IBM Canada Toronto Laboratory, told *Computerworld* that IBM is reusing code from the OS/2 Database Manager to speed development of the AIX SQL database. IBM is also working with independent

tools vendors to supply many elements of the AIX database's integrated tool set, Perna said.

"Right now, my main objective is to get it out there," Perna said. "I'm going to focus on building the best engine and working with others on the tools."

ITS DELIVERY IS important to IBM because it would fulfill the firm's stated goal of getting AIX systems and Systems Application Architecture systems to interoperate.

We'll be going out to those vendors who provide the popular and key tools in the industry." IBM will also supply some home-grown tools, she added.

The AIX database engine is being built by the same team that designed the OS/2 Database Manager, said Perna, who managed IMS and DB2 development at IBM's Santa Teresa, Calif.-based software laboratory until December. The AIX database

team is leveraging Toronto's expertise in the SQL/DS relational database, in AIX compilers and in AIX computer-aided software engineering coding. The RS/6000 database must be able to access data from all SAA SQL-based databases and from non-IBM databases, she said.

Meanwhile, IBM may be losing valuable software business because the RS/6000 is two years old, the statement of intent about an AIX database was made in February 1990, and users have many alternatives. "I do have the idea it's delayed," said Peter Kastner, an analyst at the Aberdeen Group in Boston. "I can get any one of several independent databases today, and they all have good, strong implementations under AIX."

Information systems managers at some large RS/6000 sites say they may not need IBM's AIX database and that they have based extensive applications on other databases. "We have a number of applications we developed in Ingres that are fairly important to the firm," said Richard Rogers, director of technical computers at Skidmore, Owings & Merrill in Chicago, which has nearly 100 IBM RT workstations and IBM RS/6000s.

COMMENTARY

Emma Zevik

Getting a grip on groupware



Touted loud and strong as "a way to increase workgroup productivity," Lotus' Notes has received lots of attention recently. But computer conferencing existed long before the advent of Lotus' Notes. VAX Notes, for example, offers group conferencing features for DEC systems. Causus from Camber-Roth in Troy, N.Y., is another leader in the groupware industry. And there is a smorgasbord of other vendors offering workgroup productivity solutions.

Groupware. It takes us beyond electronic mail and messaging. But just what is "groupware"? A definition eludes the industry. It is still emerging and evolving. Vendors slice and dice, then serve up a product and call it groupware. In the scramble for customers, vendors become all

things to all clients.

Is it network computing? Is it workgroup productivity? Is it cooperative, collaborative activity? Is it information sharing?

Implementation issues

Beyond the nebulous definition, there are the challenges to implementing groupware. Some of these issues include security, training and personal productivity. For instance, new participants in a groupware project may need reassurance and encouragement to join in group discussions. A good amount of hand-holding, both on-line and face-to-face, is part of the implementation process.

Employees comfortable with their E-mail systems may put up great resistance to joining in group discussions. Strategies for working with these E-mail junkies will be vital considerations to groupware training efforts. There is a distinct difference in look and feel between the privacy of E-mail and the much more public space of workgroup computing.

Workgroup computing is sophisticated computing that brings along its own complexities. At best, any groupware product can support and enhance group productivity, but that product is only a tool. If the

IN BRIEF

Proteon's JitterBuster receives U.S. patent

■ **Proteon, Inc.** in Westboro, Mass., has been awarded a U.S. patent for its jitter absorption technology, which is known as the JitterBuster, for Token Ring networks. The technology protects against signal distortion in large Token Ring networks running over lower-grade cabling. The company plans to license JitterBuster directly to other network vendors, according to Proteon.

■ **Novell, Inc.'s** NetWare Lite network operating system for small networks is available through mass merchants and computer superstores. Ethernet vendor **Ansel Communications** in San Jose, Calif., said earlier this month that it is selling the software in \$299-and-up kits that include hardware, software and cabling and are said to allow users to install their local-area networks in about 10 minutes.

■ **Compulink Management Center, Inc.** recently announced a product that it said provides portable computer users with the capability to download document and other images via remote connections to Novell LANs. Compulink, based in Torrance, Calif., said its Laserfiche Notebook software can run on notebooks and laptops based on Intel Corp. 80286 or higher chips. The software is a special version of Compulink's Laserfiche LAN document imaging software and offers full text search and retrieval and the ability to convert scanned document images into word processing text.

■ **Citrix Systems, Inc.** last week announced general availability of its Multiuser 2.0 system software product for MS-DOS. Multiuser 2.0 reportedly runs MS-DOS, Microsoft Corp.'s Windows and OS/2 applications concurrently and with support for multiple users, multitasking and the same type of systems management tools used in commercial-grade operating systems. A five-user package costs \$995, according to Coral Springs, Fla.-based Citrix.

Charting research waters

CONTINUED FROM PAGE 57

running Microsoft Corp.'s Windows.

Later this year and early next year, Equifax said, it will introduce products aimed at utility companies, telecommunications vendors and facilities management firms — already big users of GIS systems in general and ARC/INFO in particular.

"One of the big values we offer is that the data is ready to go when our customers get it," said Mark Catone, vice president of marketing at Equifax NDS, which is one of 20 wholly owned subsidiaries of Atlanta-based Equifax, Inc. "They don't have to access tapes from the census bureau and reformat it."

For ESRI, whose business is concentrated in the government sector, the increasing availability of preformatted data sets that plug into GIS applications could open doors to private sector businesses.

"We're spending a lot of time right now just educating potential clients," Boege noted.

group is not already comfortable with a cooperative, collaborative working environment, workgroup software by itself will not move people to change. That kind of work environment needs to be in place prior to groupware implementation.

Bridging the gap

What about the gap between workgroup productivity and personal productivity? In some companies, this gap might be a chasm. Just because employees may be proficient in standard personal computing skills such as spreadsheet and word processing does not mean they will automatically participate effectively in workgroup computing projects. Working in a groupware environment is a very different experience than completing a spreadsheet project.

At best, groupware offers a cooperative experience geared toward collaboration. It is a highly democratic environment. This may be disconcerting for managers and companies accustomed to working within hierarchies. Working in a groupware environment is closer to participating in a web-like structure than in a hierarchy.

Management needs to be clear as to what the purpose and emphasis of the groupware im-

plementation is. Are workers expected to contribute regularly? Will employees' on-line contributions to a group discussion be censored and monitored? In fact, does management see groupware as a useful tool for workgroup productivity? If a strong nudge to use the groupware product regularly and effectively comes from the top down, employees are far more likely to participate in workgroup computing.

For people who will be using workgroup software to assist and enhance cooperative or team-developed projects, the focus on workgroup productivity is quite different from individual personal productivity. Groupware tools require a different learning process and approach.

First of all, users do need to gain proficiency in the mechanics and basics of the software. Beyond that, however, users need to understand the benefits of information sharing and the value of collaborative activities. In re-engineering workgroup projects and processes, the end results benefit companies by making the group more effective, productive and efficient.

Zevik is a senior trainer of groupware at Computer Sciences Corp. in Lexington, Mass.

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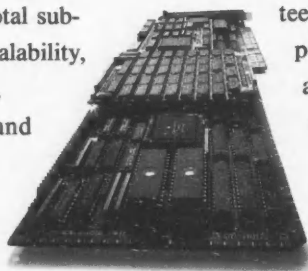
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	16	4	4	NEC
2. Maximum RAM capacity	64	64	80	AST
	112	64	80	NEC
3. Internal hard-drive storage capacity	2.7GB	1GB	420MB	NEC
	4GB	4GB	2.4GB	Tie
4. Power supply	285W	240W	167W	NEC
	388W	355W	300W	NEC
5. Internal fans	3	1	1	NEC
	4	2	2	NEC
6. Snap-in device rails	Yes	No	No	NEC
	Yes	No	No	NEC

Data based on manufacturer's published specifications.

For more information, call 1-800 NEC-INFO (in Canada, 1-800-343-4418), or NEC FastFacts at 1-800-366-0476, #XPRESS (977377), for immediate literature.

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Automated backup ships

SALT LAKE CITY — An automated backup system just announced by Fortinet, Inc. is said to allow a user on one DOS workstation to program automated backup for DOS workstations across multiple interconnected local-area networks.

Nsure is menu-driven software that provides a script language for programming unattended backup on DOS workstations and Novell, Inc. servers, Fortinet said. Support for Unix clients is scheduled for the second quarter.

Backup instructions can be sent to DOS systems across multiple LANs, provided the LANs are interconnected by

routers supporting either Novell's IPX or NetBIOS transport protocols, a Fortinet spokesman said.

Basic features include unattended operation scheduling, a history log, a volume/session database and backup of Novell NetWare servers, Versions 2.2, 3.1 and higher. The product is said to back up and restore floppy and hard disks, Small Computer Systems Interface digital audio tape and optical discs. An optional autochanger is said to support up to 300G bytes.

Nsure is available now for \$895.

ELISABETH HORWITT

Industry team plans 16G-byte data storage standard for tape

SAN JOSE, Calif. — A group of equipment manufacturers has moved to establish a new standard that would allow users to store as much as 16G bytes of data on tape by 1997. Currently, users get a maximum of 2G bytes per tape storage device.

The DDS Manufacturers Group, a collection of makers of digital data systems (DDS), said last week that its planned standard will progress gradually, with new formats for digital audio tape/DDS equipment scheduled to come out in

1993, 1995 and 1997.

DDS-2, due out in 1993, would increase tape length to 120 meters and change media formats to gain 4G bytes of storage. Further enhancements in media storage are intended to increase capacity to 8G bytes in 1995, under the DDS-3 standard.

The group plans to follow that with the final step in 1997, DDS-4, which would use new media and thinner tape tracks to create 16G bytes of storage.

MICHAEL FITZGERALD

OLICOM MAKES TOKEN-RING NETWORKS WORK FASTER

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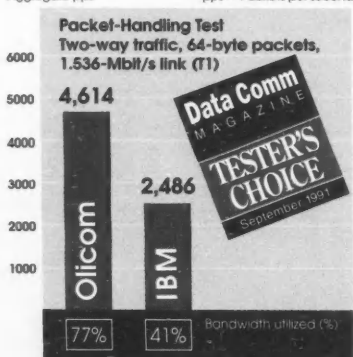
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Aggregate pps pps = Packets per second



Data Comm's Test Lab says, "Olicom's remote Token-Ring bridge delivers unparalleled packet processing—a major advantage for high-speed WAN links."

Analog offers lower cost multimedia

CONTINUED FROM PAGE 57

tions are likely to fuel the trend of putting more power in the hands of end users and further distributing corporate telecommunications and data processing functions, according to Ken Krechmer, a principal at Action Consulting in Palo Alto, Calif.

For example, one of the first uses is likely to be a computer-integrated answering machine for voice, fax and data that "gets around the horrors of voice messaging," Krechmer said.

Because most users have their own perspective on how they would like calls handled, one generic corporate system leaves some users "stuck," Krechmer said. Empowering users to configure their

ONE OF THE first uses is likely to be a computer-integrated answering machine for voice, fax and data.

own messaging systems would result in fragmentation of the telecommunications function.

The ability to put multimedia applications on current-generation Ethernet and Token Ring LANs should not usurp imminent broadband FDDI-2 and Asynchronous Transfer Mode LANs, which are better suited for running full-motion video and other potential applications where bandwidth requirements are just too great for digital signal-processing technology, said Jim Hamstra, a consultant at Stanatek in Shorewood, Minn. "This technology will deliver these applications on a onesy-twosy basis, which will spur the demand for FDDI-class multimedia."

When it announced the fax/modem chip set, Analog Devices also announced alliances with several other software vendors for integrating voice, music, still images, speech recognition, text-to-speech conversion, fax and other applications on a single microprocessor board. These vendors include Lernout & Hauspie Speech Products, Xing Technology, Inc. and EuPhonics, Inc.

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IN A CATEGORY OBSESSIVE AND LIGHTER, COMPAQ V ANOTHER ADJECTIVE

Make it smaller. Make it lighter. Make it lighter. Make it smaller.

These must be the mandates of every R&D document handed to the engineers of today's crop of notebook computers.

Admirable goals to be sure. Goals that the engineers at Compaq, however, believe fall short of making the most of portable computing.

Which explains why the latest 386SL notebook technology from the labs in Houston — the COMPAQ LTE Lite/25 and LTE Lite/20 PCs — are not only the lightest (a scant 6 lbs.) and the smallest (only 8.5"x11"x1.75") notebook PCs we've ever built. They're also the smartest.

THE BRAINS BEHIND THE OPERATION.

When it came time to design an

The COMPAQ Hibernation feature saves all open files to the hard drive and turns the unit off, either upon request or as an automatic feature. Power up the COMPAQ LTE Lite later and you're back exactly where you left off. Or drifted off, as the case may be.

intelligent new notebook, we started (logically enough) with the battery.

The new COMPAQ Power Smart Pack battery in the new COMPAQ LTE Lite delivers up to 4.5 hours of computing, a full hour longer than most.

A microprocessor inside the battery itself monitors current usage levels and



Accurate to within minutes, the COMPAQ Power Smart Pack battery gauge clearly displays current battery life.

continually calculates the available power remaining.

It can even instruct the notebook to save all open files to the hard drive if battery power should run dangerously low.

And the energy-saving features in our newest notebook PCs go far beyond the mere presence of an Intel 386SL chip.

To make the most of the smarter battery, the COMPAQ LTE Lite comes equipped with user-adjustable power-drain settings, and three different sleep modes — System Idle, System Standby and Hibernation.



A MOST MODERN MODEM.

Our optional 9600-bps modem for the COMPAQ LTE Lite PCs would make even Alexander Graham B. proud.

The COMPAQ Enhanced 9600-bps Internal Modem is compatible with the



broad base of today's existing and emerging communications protocols.

In modem talk, that means true V.32 9600-bps data transmission and

Just slip the COMPAQ LTE Lite into the COMPAQ Desktop Expansion Base and you're instantly connected.

Expansion slots, external ports, and mass storage bays give you immediate access to monitors, networks, hard drives, tape drives, CD-ROM and more.

And all the while its built-in security features ensure a safe harbor for your Compaq notebook.

V.42 bis compression for up to 38.4 kbps throughput, as well as error control and full support for Hayes AutoSync.

This little marvel negotiates the fastest transmission throughput that the other end of the line can

muster, whether it's sending or receiving. It

even drops to a low power-drain standby state and monitors incoming signals if you're waiting for a call to come in.

Or for that matter, another modem to catch up.

NOT ONLY SMART, BUT BRIGHT.

The new, efficient COMPAQ Maxlight VGA display provides a much brighter screen than our previous notebooks without sacrificing battery life.

Sharper graphics and text in up to 64 shades of gray complement an enhanced



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RESSED WITH SMALLER WOULD LIKE TO SUGGEST CTIVE: SMARTER.

video subsystem that's so fast it virtually eliminates "submarining," also known as "where did that #%\$**# cursor go?"

A NOTEBOOK THAT'S USELESS IN THE WRONG HANDS.

At Compaq, we know that data security is just as important as hardware security.

At the hardware level, DriveLock locks the hard drive, preventing access to data even if the drive is removed from the notebook.

One-touch QuickLock and QuickBlank functions allow you to quickly (surprise) disable the keyboard or blank the screen for privacy.



Isolated inverted "T" cursor controls are in a familiar position so you don't have to teach your fingers new tricks.

And of course, for hardware security, our new notebooks come with a Keylock slot for an optional cable lock.

With all of the above, plus a 120-MB hard drive,* RAM expansion to 10 MB, cache memory,* simultaneous display, and an auxiliary battery, to say these are the best notebooks we've ever made would be something of an understatement.

To back them with a one-year world-wide warranty and our toll-free Compaq Customer Support

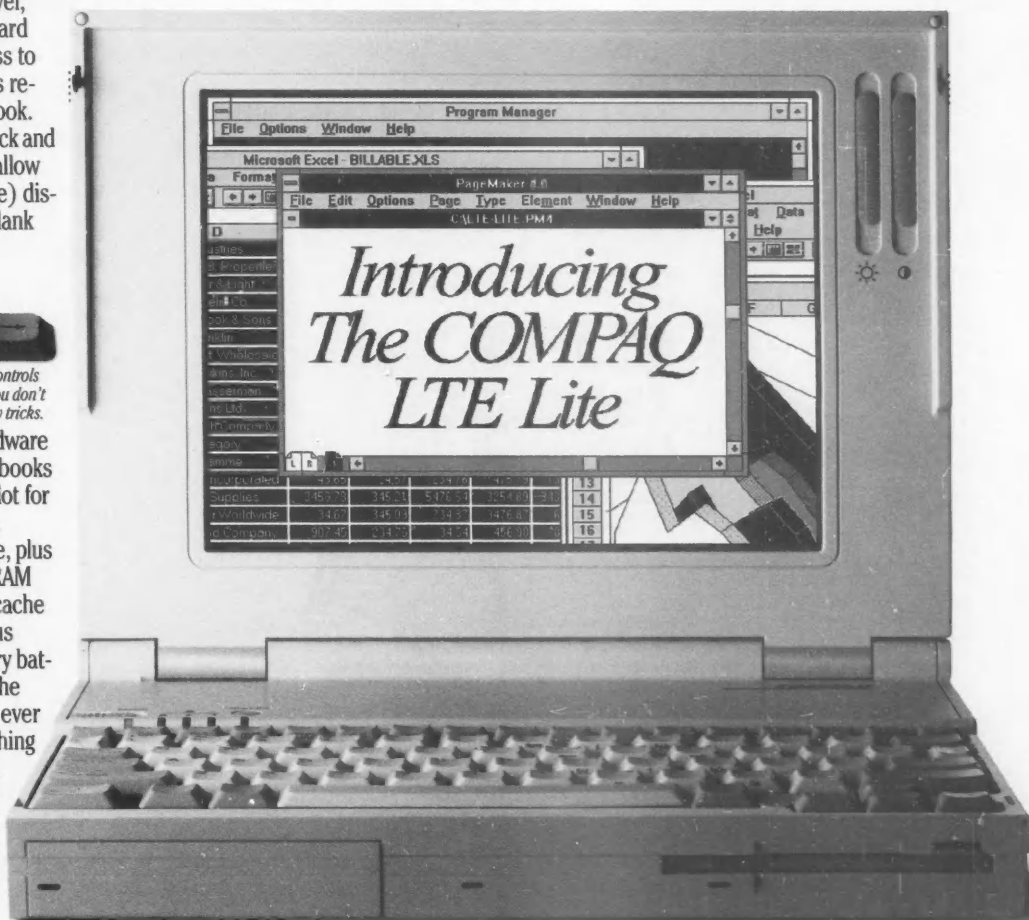
Center hotline would be more like it.

So if you've been trying to choose between a small notebook computer and a smart notebook computer, don't.

Choose both. Choose one of the new COMPAQ LTE Lite notebook PCs.

For more information about our new

notebooks or the location of the Authorized COMPAQ Reseller nearest you, call Compaq in the U.S. at 1-800-231-0900, Ext. 100, or in Canada at 1-800-263-5868, Ext. 100.

COMPAQ

Actual weight: 6 lbs. Actual dimensions: 8.5" x 11" x 1.75". Actually, this is the best notebook we've ever built.

NEW PRODUCTS

Local-area networking hardware

Extended Systems has extended its line of EtherFlex printer connectivity products.

EtherFlex cards connect Hewlett-Packard Co. LaserJet printers directly to a network, with concurrent support for Novell, Inc. NetWare and Apple Computer, Inc. EtherTalk over a single Ethernet connection. The cards automatically switch between Adobe Systems, Inc. PostScript and PCL languages. Prices range from \$695 to \$795, depending on the physical connection required.

The company has also begun shipping the BridgePort ESI-2671A, which fits into an optional I/O slot and allows personal computers, workstations and Apple Macintoshes to connect directly to the printer. It also provides automatic switching between PostScript and PCL.

The price is \$495.
Extended Systems
6123 N. Meeker Ave.
Boise, Idaho 83704
(208) 322-7575

Anco Corp. has expanded its line of Ethernet local-area network products.

The company has announced two parallel port adapters for portable comput-

ers, with four connections per adapter. The products are priced at \$345 each.

Anco also announced new 8-bit and 16-bit network interface cards, priced at \$170 and \$180, respectively, and an 8-port 10Base-T hub priced at \$450.

Anco
9477 Archibald Ave.
Rancho Cucamonga, Calif. 91730
(714) 945-1365

Ungermann-Bass, Inc. has introduced the Access/One 2-slot smart hub enclosure.

The product accepts two full-size Access/One hub modules as well as plug-in half-card modules for network connections and management. It is intended for small departments and remote locations that require access to enterprise network

resources, the company said.

The price is \$995.
Ungermann-Bass
3900 Freedom Circle
Santa Clara, Calif. 94054
(408) 496-0111

Digital Equipment Corp. has announced the DECserver 90TTL multiprotocol terminal server.

Terminals, modems, printers and personal computers can be connected via the DECserver 90TTL to any network service that supports Transmission Control Protocol/Internet Protocol. It provides eight ports with connections speeds up to 57.6K bit/sec. It can be snapped into the DECchub 90 Ethernet backplane as local-area networking needs grow, and it can be managed via Simple Network Management Protocol or by Maintenance Operation Protocol.

The stand-alone version costs \$1,750. The hub-based version is priced at \$1,595. Both versions are available immediately.

DEC
146 Main St.
Maynard, Mass. 01752
(508) 493-0849



DECserver 90TTL can be snapped into the DECchub 90 Ethernet backplane

Local-area networking software

Intercomputer Communications Corp. has released RLN, a remote local-area network access product.

RLN allows remote users to become fully functional nodes on the LAN. It is transparent to the network operating system and protocol-independent, the company said. RLN offers data compression for enhanced throughput and several levels of security.

Pricing ranges from \$430 for a two-user system to \$6,600 for a 16-user system.

Intercomputer Communications
8230 Montgomery Road
Cincinnati, Ohio 45236
(513) 745-0500

Electronic mail

Wang Laboratories, Inc. has announced an entry-level voice processing system that can function as a local-area network server for electronic mail and voice mail.

The Voice Server Package features centralized administrative control, access to multiple databases and support for large port and storage capabilities.

It can be integrated with a private branch exchange as well as with an E-mail system.

Pricing ranges from \$25,000 to \$51,000, the company said.
Wang Laboratories
1 Industrial Way
Lowell, Mass. 01851
(508) 459-5000

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Lynn L. Wells
Document Management Representative



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Working together, they saw that merely upgrading equipment to add capacity was not the solution. So they took a fresh approach and completely redesigned the company's document publishing processes. Carefully building on existing systems, they integrated Xerox workstations, software, scanners and laser printers to create a custom publishing network.

Benefit booklets that once took forty-five days to publish now take less than five, a 900% increase in productivity. MICR-encoded checks and claims explanations are being printed and mailed together, saving \$350,000 a year in postage. And forms are now created electronically, on demand, reducing costs by 30%.

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ENTERPRISE NETWORKING

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COMMENTARY

Elisabeth Horwitt

Promises, promises



Sometimes vendors seem to plan their product strategies high in the clouds, far above the day-to-day concerns of the average network manager.

This is reflected in some of the high-flying promises DEC and IBM have been making about their enterprise client/server platforms: that sometime in the next three to five years they will enable their customers to tie together and manage whatever workstations, servers, hosts and LANs they happen to own via a solution that is all-encompassing, enterprisewide, interconnected, open and user-friendly (AEIOU).

It's hard to believe that DEC and IBM will fulfill all of their promises on time. The point is that while they flog their R&D people to realize their plans for dominating the Fortune 1,000 market into the next millennium, they are giving short shrift to the present, down-to-earth needs that their customers must cope with right now.

Take Mark Roy, a network operations consultant at John Hancock Financial Services in Boston. His organization is in the process of putting together an enterprise information system with the goal of linking users throughout the enterprise to the information and applications they need, even if they and the data happen to be on disparate systems and LANs. "Our ultimate dream," Roy says, "is to have two cables to each workstation: one for voice, one for data."

DEC has talked to Roy about its plans to make Pathworks a sort of glue that sticks together all kinds of disparate clients and servers. However, the vendor's scenario sounds a bit too ambitious for him: "There's what you can do and what you should do; that glorious level of utilization [promised by DEC] may work for some companies, but I don't see us going that far."

Meanwhile, Roy is struggling to get Pathworks to perform a comparatively simple task: interconnecting PC workstations on Token Rings to

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Answering users' interconnectivity needs

ANALYSIS

BY ELISABETH HORWITT
CW STAFF

While internetworked local-area networks are undoubtedly proliferating at Fortune 1,000 companies, the majority of firms are still busily linking their branch office LANs to corporate IBM hosts, using IBM's traditional Systems Network Architecture (SNA).

Only leading-edge Fortune 100 companies are getting serious about moving from tradition-

al hierarchical SNA networks to internetworked LAN backbones that run Transmission Control Protocol/Internet Protocol or Novell, Inc.'s IPX, and it will take years for IBM's peer-to-peer SNA plan to take hold in the corporate environment.

These premises form the basis of a recent study by Forrester Research, Inc., as well as the product strategies of certain third-party SNA vendors — not to mention IBM itself.

Forrester predicted that SNA traffic would take up 88% of Fortune 1,000 wide-area networks

at branch offices during 1993 and 1994 and would shrink to 70% in 1995 and 1996.

LAN internetworking traffic would make up the rest of enterprise communications, the Cambridge, Mass., firm said.

IBM spokespeople have said for years that a key element of the vendor's much-vaunted move to peer-to-peer SNA will be the ability to keep supporting customers' existing 3270-based mainframe applications.

Indeed, IBM's announcement last week addressed how to run those applications unchanged

across IBM Advanced Peer-to-Peer Networking (APPN) links using new versions of IBM's host-based Virtual Telecommunications Access Method software.

Some users are digging in their heels and waiting until they have a clearer picture of which peer-to-peer networking protocols will come out on top. At a recent Forrester conference, an information systems manager at Whirlpool Corp. said his company "doesn't want to change for each technology that comes out"

Continued on page 72

Imaging to boost use of high-speed WANs

BY ELLIS BOOKER
CW STAFF

NORWELL, Mass. — Electronic imaging will fuel the growth of high-speed wide-area networks, according to a recent study by BIS Strategic Decisions here.

Imaging applications will account for 13% of the WAN traffic growth through 1995, predicted the study, which involved about 800 interviews with senior communications managers.

Documents will represent the largest slice of WAN imaging traffic. By 1995, the study states, 43% of companies with 250 or more employees will be transmitting documents outside their local access and transport area. Currently, most document imaging is intralocal and intracompany.

In addition to documents,

photographic images (both still pictures and video) will be transmitted across WANs. The health care industry, with applications such as the transfer of X-ray images between sites, will be the leading vertical market for photographic imaging. By 1995, 6% of health care sites with 250 or more employees will be using their WANs for this application. Similarly sized advertising/journalism sites will be second, with a 4% penetration by 1995, the study predicted.

"Imaging as an intracompany medium is beginning to accelerate, and the next step will be intercompany communications," said David Kerr, an associate director for North American communications at BIS.

Kerr said the growth pattern of imaging communications will match that of electronic mail,

which typically starts as a local-area network application, branches to interconnected LANs within a department or a division and is finally deemed useful for connecting to sites outside the company.

The impact of these bandwidth-hungry applications on LANs and public WANs will be significant, Kerr said.

Trading up

Kerr said he sees photographic imaging in particular putting pressure on 4M and 10M bit/sec. LANs, causing users to exchange them over time for 100M bit/sec. Fiber Distributed Data Interface LANs.

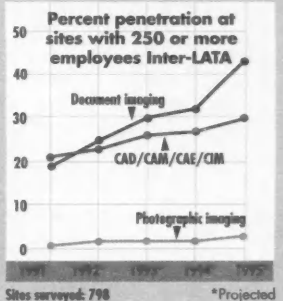
Likewise, high-speed WAN technologies will receive a boost from the increased requirements of image communications, he said.

One beneficiary of this trend, Kerr said, will be Switched Mul-

timegabit Data Service, an emerging switched technology from public carriers that offers speeds of 1.2M to 34M bit/sec.

Well-documented

Document imaging will be the primary growth area for WAN image handling



Source: BIS Strategic Decisions
CW Chart: Janel Genovese

Finally, Kerr said, it is not unreasonable to expect imaging vendors to pair with LAN/WAN equipment vendors.

French railroad rides the OSI track

BY ELLIS BOOKER
CW STAFF

LYONS, France — Stereotypes aside, students of European data communications know that open protocols are not ubiquitous on the Continent by any means. While users in this part of the world have much to gain from standards — in networking in particular — European companies have not wildly outpaced their U.S. counterparts when it comes to adopting the Open Systems Interconnect (OSI) model.

One exception to this rule is the Societe Nationale Des Chemins De Fer Francais (SNCF), the French national railway sys-

tem. The SNCF's OSI-based network, due to be completed by midyear, will handle some 60,000 incoming and 20,000 outgoing messages daily, making it perhaps the largest user of OSI-Message Handling System (MHS) in the world.

The messaging infrastructure is a portion of SNCF's Sesame application, the major information system of its freight division. Sesame, which went into operation last October, was built in cooperation with Unisys Corp.

Dubbed Sinfonie, the message handling application architecture also provides OSI-based

ON SITE

Societe Nationale des Chemins de Fer Francais Lyons

• **Problem:** Needed a standards-based network infrastructure to further goal of a "zero paper" environment.

• **Technology:** OSI-MHS messaging across private X.25 packet data network. Will use X.400 messaging for E-mail among individuals and to link applications. Plans to use X.400 as infrastructure for EDI communications with some of its 22,000 customers.

electronic data interchange for exchanging information with its customers.

The first OSI-MHS application put in service under Sinfonie, named Everest Junior, monitors 8,000 special freight cars and will eventually be expanded to monitor 200,000 freight cars.

A similar system, called Minerve Junior, has also been deployed to eventually monitor the maintenance of 15,000 passenger cars.

For transport of all this messaging, the railroad will use Retipac, the private X.25 data network it has used since 1983.

As part of the deployment, SNCF installed two Unisys 2200/622ES mainframes and migrated its data processing center from Paris to Lyons.

Groupe Bull unveils DCM components

IDG NEWS SERVICE

HANNOVER, Germany — State-owned French vendor Groupe Bull unveiled the key components of its Distributed Computing Model (DCM) at the recent CeBIT trade show here, including the new tools and specifications that DCM will rely on.

Users were shown a line of programs and services that permit operations on different platforms, such as Bull's proprietary GCOS operating system and various Unix-based platforms. Not only has Bull chosen to integrate the Open Soft-

ware Foundation's Distributed Computing Environment (DCE) into its DCM offering, but it has also decided to supply the CMAPI programming interface for the network management functions of the OSF's Distributed Management Environment, which is complementary to DCE.

All-points management

Bull's Integrated System Management will offer management functions from all points on a company's network. The Distributed Computing Facility utility, which is also based on DCE technology, will give Bull users access to X.500 network direc-

tory services.

Bull also announced that Affinity and Openteam products will be included in its DCM line. Openteam will offer better management of local network connections, Bull said.

In addition, ImageWorks electronic management software will be adapted to client/server architectures, bringing imaging to transaction applications and standardization of procedures for networked users.

Bull also launched a new multiwindow terminal, the Questar 330, developed for distributed environments.

Horwitt

CONTINUED FROM PAGE 69

DEC hosts on Ethernets. When last heard from about a month ago, he was close to the solution, but that depended on bringing in a third-party router first.

A similar dialogue is going on between IBM and its customers, with discussions focusing on the vendor's plans to provide an all-encompassing network architecture. In the next few years we can expect IBM to come up with a fast-packet switch that interconnects just about any type of LAN and a peer-to-peer SNA protocol called APPN+ that will link just about any type of LAN or system at fast-packet speeds. IBM also plans to support the OSF's DCE for peer-to-peer networking.

IBM's long-term networking scenario manages to hit just about every hot button and buzzword currently in circulation. However, some major users would like a clearer direction, one that perhaps does not include so many overlapping and potentially conflicting choices.

Banc One in Columbus, Ohio, for example, is just beginning to take advantage of IBM's LU6.2 protocol as a way to make workstation-to-host connections more efficient. The next step for Banc One will be putting in regular APPN as a way to make dynamic connections between workstations across the enterprise, possibly over ISDN links. The long-term goal is to implement DCE.

Banc One Vice President Terry Lowder says he is counting on IBM to eventually blend APPN and DCE. However, he has reservations about the number of eggs and networking baskets that the vendor is now juggling.

Horwitt is a *Computerworld* senior editor, networking.

IN BRIEF

HP product passes federal testing

■ **Hewlett-Packard Co.** has claimed to be the first vendor to pass all conformance tests required by the federal government's Government Open Systems Interconnect Profile testing program for Open Systems Interconnect (OSI) Services. HP said its latest product to pass the tests was the File Transfer, Access and Management product.

■ OSI vendor **Retix** in Santa Monica, Calif., said it is now supplying portable application programming interface source code for the 1988 version of the X.400 messaging standard.

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The offer is made only by the Prospectus.

New Issue / March 19, 1992

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Thomas H. Securth
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Users' interconnectivity needs

CONTINUED FROM PAGE 69

and wants a clearer picture of how IBM will integrate APPN with the Open Software Foundation's Distributed Computing Environment before moving from a more traditional SNA environment.

Meanwhile, third-party SNA gateway vendors such as Sync Research, Inc. and Apertus Technologies, Inc. are aggressively rolling out product enhancements to target customers who want to interconnect their LANs to existing SNA environments.

Apertus in Eden Prairie, Minn., is an SNA LAN gateway company that until recently sold only to regional operating companies. The company has just introduced to the commercial market its Datastar product, a communications server with a switched backplane that can be configured to integrate SNA devices with various LAN environments, according to the company's chief executive officer, Bob Gordon (see story below).

Out West

Meanwhile, Sync Research in Irvine, Calif., has been rolling out a series of LAN-to-SNA products, the latest of which is the SNA Network Access Controller-Ethernet Concentrator. This

product is said to link IBM cluster controllers on Synchronous Data Link Control (SDLC) lines to Ethernet LANs for connection to IBM hosts. Scheduled to ship in September, the product has not yet been priced.

Sync Research has concluded that "there is no big drive for our customers to have peer-to-peer connectivity," said company spokesman Lynn Nye. "They are still investing in 3270."

Sync Research, like Apertus, is concentrating its efforts on providing more efficient methods for IBM SNA devices to make use of LAN connections via traditional IBM SDLC connections. "The big Fortune 100 guys may be interconnecting their LANs, but our mainstream customers have local LANs that they want to link to the host, not each other," Nye said.

On the other hand, a number of router vendors are preparing to support IBM's APPN protocol so that they can carry SNA traffic, as well as popular LAN protocols, on the same LAN-to-LAN backbone. Cisco Systems, Inc., for example, has promised that its routers will handle SNA PU4 sessions in a limited way by the third quarter and APPN protocols by 1993.

Latest LAN gateways

LAN gateway vendors have come a long way from simply setting up 3270 sessions between LAN workstations and IBM hosts.

One recent entry into the commercial LAN-to-SNA market is Apertus, formerly microcomputer-to-mainframe vendor Lee Data. The company recently introduced Datastar, a communications server with a switch-based backplane that sits between a LAN and an IBM host.

A variety of cards configure Datastar to handle different connections. The product can be managed by a range of network management platforms, including IBM's NetView and Simple Network Management Protocol-compatible systems.

Host access

One Datastar configuration, the Telnet Gateway, is said to allow devices running the TCP/IP Telnet terminal-to-host protocol to access IBM hosts via SNA, bisynchronous and asynchronous protocols. Optional host channel, Token Ring, Ethernet and SDLC connections are available.

Available now, the gateway currently supports up to 500 Telnet-to-3270 sessions and is scheduled to increase its capacity to 1,000 sessions by May, according to Apertus.

The product is priced between \$16,405 and \$52,200. A 128-session configuration is said to cost \$195 per session, or \$100 per session less than some competing boxes. The box's ability to translate TCP/IP protocols to SNA eliminates the need to implement IBM's TCP/IP software on the host,

which can consume a large portion of the host's CPU power, Apertus said.

Another Datastar product is the LAT Gateway, which is said to enable Digital Equipment Corp. Local Access Transport terminals to access the IBM host from a Token Ring or Ethernet LAN or via SDLC. It is priced from \$7,995 to \$12,995.

Another midrange gateway

The Down Stream Physical Unit (DSPU) gateway is said to allow users on Token Ring or Ethernet LANs to access IBM resources on either an SDLC or a channel connection. Up to 250 SNA devices are supported per gateway, and a single Datastar box can support up to seven DSPU gateways. The product is priced beginning at \$10,400.

Apertus also announced three servers designed to connect terminals to hosts via LANs. The servers support up to 400 terminal-to-host sessions without degradation, while IBM's 3174 Establishment Controllers only support 64 sessions per box, Apertus said.

Different configurations allow both IBM and ASCII terminals to access IBM hosts via Token Ring or Ethernet LANs. TCP/IP protocols are also supported. In addition, the Datastar SDLC Link Server is said to allow terminal-to-host traffic to run over LAN inter-network backbones. Terminal server prices range from \$8,775 to \$63,450.

Apertus also announced that it will start reselling Netlink, Inc.'s SDLC Link Server and Internetwork SNA Gateway as its low-end LAN-to-host solutions.

ELISABETH HORWITT

NEW PRODUCTS

Modems

UDS Motorola has announced the LanFast modem, which provides remote local-area network access over dial-up lines.

The modem includes an adapter that allows it to connect directly to network cabling, eliminating the need for a dedicated personal computer, the company said. Also included is the company's LanFast communications software. LanFast allows LAN-to-LAN as well as PC-to-LAN connections.

The price is approximately \$2,000.

UDS Motorola
5000 Bradford Drive
Huntsville, Ala. 35805
(205) 430-8000

Customer-premises equipment

Promptus Communications, Inc. has announced Integrated Services Digital Network (ISDN) Basic Rate access for its OASIS line of bandwidth-on-demand products.

Each Multiline BRI provides access to two 56K or 64K bit/sec. ISDN B channels. OASIS' inverse multiplexer capability allows users to combine channels into a single line for high-speed data applications such as video teleconferencing and image retrieval.

The Multiline BRI for the Oasis 1000 Bandwidth Controller costs \$3,000.

Promptus Communications
207 High Point Ave.
Portsmouth Business Park
Portsmouth, R.I. 02871
(401) 683-6100

Wide-area networking software

Morning Star Technologies, Inc. has announced synchronous and asynchronous Point-to-Point Protocol (PPP) for the IBM RISC System/6000 platform.

The product provides transparent wide-area connection between local-area networks via Transmission Control Protocol/Internet Protocol. In conjunction with the company's SnapLink product, PPP provides synchronous communications at speeds up to T1 throughput.

The cost is \$795 per license.
Morning Star Technologies
1760 Zollinger Road
Columbus, Ohio 43221
(614) 451-1883

Micro-to-host

InterCon Systems Corp. has upgraded TCP/Connect II for Apple Computer, Inc. Macintoshes.

TCP/Connect II provides terminal emulation for Tektronix, Inc., IBM and Digital Equipment Corp. platforms. The new release, Version 1.0.9, supports Apple's System 7.0 and adds Simple Network Management Protocol support for remote network management. The text editor has also been enhanced.

Pricing is from \$195 to \$495, depending on the emulation selected. Upgrades for registered users are free.

InterCon Systems
950 Herndon Pkwy.
Herndon, Va. 22070
(703) 709-9890

Walker Richer & Quinn, Inc. has introduced Reflection 4 Plus, a VT terminal emulator for color graphics, for Apple Computer, Inc. Macintosh systems.

The product gives Macintosh users access to graphics packages running on Unix and VMS hosts. It works over a variety of physical connections, including network and serial connections, and is compatible with Apple's System 7.0. It supports the Macintosh Communications Toolbox Connection Manager, the company said.

The price is \$369.
Walker Richer & Quinn
2815 Eastlake Ave. East
Seattle, Wash. 98102
(206) 324-0350

Micro-to-micro

Hilgraeve, Inc. has begun shipping Version 2.1 of HyperACCESS/5, its asynchronous communications software.

Version 2.1 implements new Modular Communications Engine technology for higher performance, the company said. It also adds support for Transmission Control Protocol/Internet Protocol and shared modems on local-area networks and includes new communications scripts and virus protection.

The DOS version costs \$99.95; the DOS and OS/2 versions combined cost \$199. Upgrades cost \$29.95.

Hilgraeve
111 Conant Ave.
Monroe, Mich. 48161
(313) 243-0576

Gateways, bridges, routers

Eicon Technology Corp. has announced Router for OS/2.

The product connects to a file server or personal computer using the company's EiconCard intelligent coprocessing card. It routes Microsoft Corp. LAN Manager and IBM OS/2 LAN Server traffic between remote local-area networks via X.25 lines or leased point-to-point lines. As a result, LAN nodes have access to resources on both local and remote LANs. Each router supports connection to four EiconCards and handles up to 254 simultaneous sessions.

The product is priced at \$995.

Eicon Technology
2196 32nd. Ave.
Montreal, Quebec H8T 3H7
(514) 631-2592

Utilities

Enterprise Data, Inc. has released Upstream for Windows, an LU6.2-based backup and restore software product.

Users can back up data from personal computers and local-area networks to MVS mainframes. Supported features include automatic operation and selective backup. Data can be stored in the VSAM On-Line Repository or archived to tape storage. The mainframe component runs as a VTAM application and supports multiple concurrent backups.

Pricing starts at \$14,000, including the mainframe component and one file server license.

Enterprise Data
1055 Parsippany Blvd.
Parsippany, N.J. 07054
(201) 316-0500

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Robert D. Haas

Robert D. Haas
Chairman & CEO

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Anthony J. Alfano

Anthony J. Alfano
Assistant Vice President

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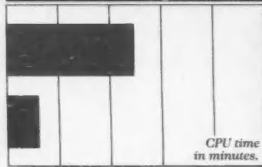
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PLATINUM Rapid Reorg™ vs. DB2 V2.3 REORG Utility

On a 67,700 page tablespace, PLATINUM Rapid Reorg used 3.34 minutes of CPU time compared to 12.68 minutes for the IBM REORG utility. That's a 73% CPU time savings with PLATINUM.



PLATINUM Rapid Reorg's run of 9.57 minutes was 158% faster than IBM's 24.72 minute result. Running PLATINUM also improved EXCP performance. Our run used 35,282 while IBM consumed 54,000.

PLATINUM Fast Load™ vs. DB2 V2.3 LOAD Utility

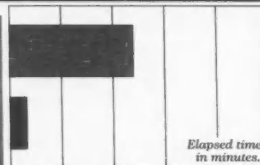
On the same 67,700 page tablespace, PLATINUM Fast Load used 2.82 minutes of CPU time compared to 12.58 minutes for the IBM LOAD utility. That's a 78% CPU time savings with PLATINUM.



With performance nine times faster than IBM LOAD (4.82 minutes vs. an off-the-chart 43.45 minutes) and 69% fewer EXCPs, all we can say is, "Wait until you see the numbers for our soon-to-be-released PLATINUM Fast Unload."

PLATINUM Quick Copy™ vs. DB2 V2.3 COPY Utility

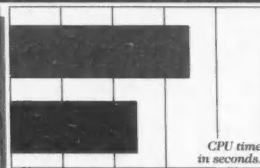
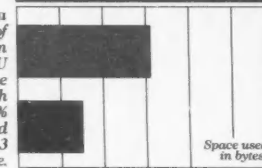
For an image copy of a 67,700 page tablespace, PLATINUM Quick Copy used 12.62 seconds of CPU time compared to 42.49 seconds for IBM. That's a 70% CPU time savings.



PLATINUM Quick Copy's performance of 2.87 minutes was more than eight times faster than the 23.38 minutes it took IBM to copy a 67,700 page tablespace. Our 88% time savings were topped by an EXCP reduction of 90%.

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LARGE SYSTEMS

HARDWARE • SOFTWARE • STRATEGIES

Tandem still small fish in Unix pond

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

CUPERTINO, Calif. — When Tandem Computers, Inc.'s fault-tolerant Unix system, Integrity S2, was launched in 1990, it was sold as a platform for packaged applications — and as the foundation for Tandem's foothold in the Unix business. The redundant, three-CPU computer ran a toughened Unix operating system to resist 700 different Unix "panics" that could crash other systems, Tandem said.

In the two years since its debut, the Integrity has yet to make a significant dent in the commercial Unix marketplace,

and its installed base is measured in only hundreds of units worldwide, analysts said. Still, it has found a market niche as the basis for telecommunications applications servers used by AT&T, regional Bell operating companies and phone companies in the U.S. and abroad.

Industry analysts said they believe that Tandem sold about \$27 million worth of the fault-tolerant Unix machines in 1991. Meanwhile, competitors Sequoia Systems, Inc. and Stratus Computer, Inc. earned \$59 million and \$30 million, respectively, in the fault-tolerant Unix market, according to International Data Corp., a market research firm in Framingham, Mass. Sequoia resells units to

Hewlett-Packard Co., and Stratus supplies IBM with units for its IBM System/88.

Sales on rise

Integrity got off to a slow start in March 1990, when it was based on the Mips Computer Systems, Inc. R2000 reduced instruction set computing chip. That chip gave it only a marginal price/performance advantage over Integrity's competitors, analysts said. In October 1991, Tandem upgraded most models to a R3000 chip. Now, the price/performance ratio is better, and sales are increasing, according to

Tandem. Bruce Dougherty, vice president of Tandem sales, said one-third of the firm's new customers ordered Integrity systems last quarter.

Tandem is clearly the leader in the worldwide \$2 billion fault-tolerant market, garnering more

than half of all sales with hardware running its Guardian operating system. But users who require true fault tolerance rather than fault resistance in Unix machines are relatively few. "I think Tandem's been having a tough time in the fault-tolerant Unix market," said Rikki Kirzner, a senior analyst at Dataquest, Inc. in San Jose, Calif. OEM sales to vendors such as

AT&T account for most sales, while end-user sales have been extremely limited, she said.

The largest customer is AT&T, which modifies the Integrity machine and resells it to telephone companies as the AT&T StarServer FT.

StarServers monitor network performance, col-

Tandem's Integrity systems

Unix-based fault-tolerant systems built on Mips microprocessors.

Introduced in January 1990.

Provided by Tandem/AT&T alliance and used largely by telephone companies.

Use triple modular CPU architecture in which two "voter" modules check results produced by three processors.

CW Chart: Janell Genovese

To page 78

Holiday Inn books Unix-based systems

BY MARYFRAN JOHNSON
CW STAFF

ATLANTA — Hoping to outdistance competing hotel companies through its use of information technology, Holiday Inn Worldwide recently announced that it is investing more than \$60 million in new Unix-based front-desk and reservation systems for its 1,600 hotels.

"We're outsourcing it all," said Richard L. Smith, vice president of information technology at Holiday Inn's corporate data center here. "We've built an outsourcing program to integrate the hardware and software and are now in the process of going out to bid for the employee education part."

Working with Andersen Con-

sulting as its outsourcer, the hotel chain is building the Holiday Inn Reservation Optimization (HIRO) system. Holiday Inn is also working on a second project, a new property management

Holiday Inn

system that will streamline reservations, check-in procedures and a host of guest services.

Installation of both systems will begin in the fall, and both will be integrated with Holiday Inn's mainframe-based Holidex system, the largest centralized room inventory of any hotel reservation system in the world, company officials said.

"Optimization means that when a guest calls in and asks for a three-night reservation, the hotel tries to optimize on one night at a time," Smith explained. "With the HIRO software, the hotel can look at length of stay and give that customer preferred treatment if he's staying more than one night."

HIRO will run on a Unix hardware platform that will be chosen within the next 30 days, Smith said. The leading contenders are Hewlett-Packard Co. and NCR Corp., he added, although IBM and Sun Microsystems, Inc. are also in the running.

The software will add a new dimension to reservation system technology as the first automated length-of-stay optimization software to be integrated with a central reservation system, Smith noted. "We will be unique with this, for a while at least."

"Over the years, we were the

first major hotel chain to offer a centralized travel agent commission plan, to direct-link our reservation systems with the airline reservation systems and the first to automate room-rate updates," he added.

Holiday Inn Worldwide, with nearly 326,000 guest rooms in 52 countries, is owned by the UK's leading brewer, Bass PLC.

"With HIRO, the reservationist has access to all rooms, at all price points, to give guests the room they need," said Trevor Jones, Holiday Inn's senior vice president of corporate development.

Speedier service

The property management software, leased from Encore Systems, Inc. in Atlanta, will run under The Santa Cruz Operation's SCO Unix on 1,600 IBM Personal System/2s.

"This property management

software will improve the opportunities for our hotels to recognize repeat guests and lessen the amount of information we have to collect from them," Smith said. "They won't have to fill out reservation cards or even pass across a credit card. They can walk up to the desk, check in and walk to the same room every time, if they want."

The Encore database on the PS/2s will be linked to an IBM DB2 database on IBM mainframes at the data center in Atlanta. The Hyatt Hotel Corp. also uses an Encore database system, which runs on HP Series 800 Unix midrange machines.

"Our hotels are extremely excited about gaining some automation in their properties," Smith said. "They'll be able to learn a lot more about their customers and stop some [reservations] from falling through the cracks."

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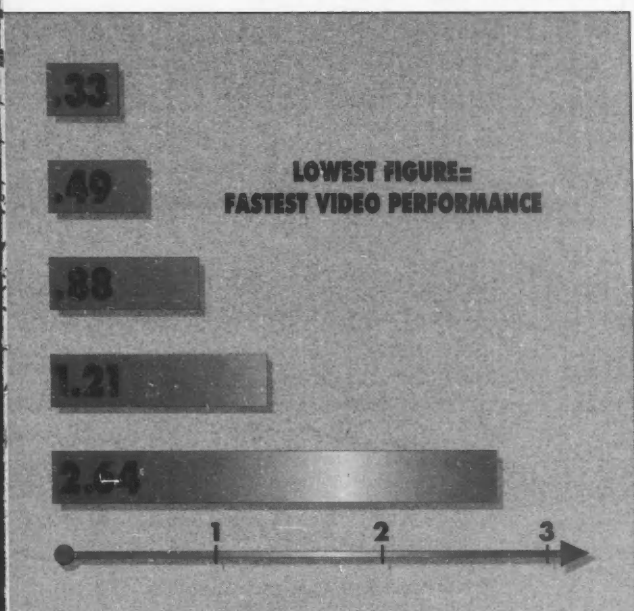
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Because ↑ is the way you want to go.

NEC

Belgian bank performs electronic house calls

Unix-based computer service allows customers to conduct account transactions from home, work

BY SALLY CUSACK
CW STAFF

BRUSSELS — Whether they are at home or work, customers of Bank Brussels Lambert can conduct account transactions via a service that allows a personal computer to link directly into the bank's Unix-based network.

The European bank has more than \$66 billion in assets and has been using a combination of Pyramid Technology Corp. and Sun Microsystems, Inc. workstations. Recently, the bank added new levels of fault tolerance with the purchase of several Stratus Computer, Inc. XA/R Unix-based fault-tolerant systems to keep its four primary electronic services running around the clock. These services include the following:

- **Telelink**, a service started in 1982 that enables businesses to make direct payments to employees and suppliers.

- **Telefin**, a service that allows businesses to arrange financing and get on-line approval for their customers.

- **Home Bank**, a service initiated almost two years ago that permits bank customers to make payments and transfer funds from their home PCs.

- **Office Bank**, a new service designed to let employees at subscriber firms do personal banking via the desktop systems in their offices.

Electronic design

The network is designed to handle several electronic banking system operations, and it is capable of handling more than 400,000 customer calls per month, said Johan De Meyer, manager of electronic banking services.

The addition of the reduced instruction set computing-based Stratus boxes

was essential, De Meyer said, because "if the network is down, our remote banking business is

out of business."

De Meyer said he estimates that there are 12,000 customers with access to the Unix-based network via PC-DOS or Apple Computer, Inc. systems, and he predicted that number will increase to 50,000 during the next two years. Currently, approximately half of the customers are Home Bank service users.

The bank has installed Sun-3 and Sun-4 workstations for all telecommunications aspects at the front end. The customer simply logs on to the Sun, enters an identification number and password and is connected via Ethernet to one of the two Pyramid boxes that run the applications.

The Stratus machines are connected to the Pyramid and handle database access and funds transfer.



Bank Brussels Lambert
Brussels

- **Challenge:** To extend open systems approach to on-line remote electronic banking services for both corporate and domestic customers.

- **Solution:** Stratus' SA/R Continuous Processing systems for Unix-based, RISC-based funds transfer and database access services.

NEW DEALS

SSA awards \$7.7M service contract

- The **Social Security Administration** has awarded **Martin Marietta Corp.** a \$7.7 million contract to provide its Office of Information Management Administration with software engineering and services.

- Reservation systems for train passage through the new English Channel tunnel will be handled through use of the same technology utilized in **AMR Corp.**'s Sabre system. AMR subsidiary **AMR Information Services, Inc.** and the **Societe Nationale des Chemins de Fer Francais**, the French national railway, recently contracted to provide the system for the Cross Channel Passenger Service, which will link the UK, France and Belgium via the 94-mile tunnel by mid-1994.

- **University Microfilms International** in Ann Arbor, Mich., recently chose **NCR Corp.**'s Document Management System (DMS) to handle scanning and storing of periodicals and journals for its worldwide library service. DMS will allow University Microfilms to scan, index and store periodicals as electronic images, which are then transferred to compact disc/read-only memory for distribution to libraries.

- **LMG Smith Brothers** in the UK recently selected a \$1.2 million **Sequoia Systems, Inc.** Series 400 computer to improve the company's manufacturing operations. Up to 400 on-line users at LMG, an international packaging and printing company, will access the Sequoia system for shop floor input and control of inventory, production and materials distribution. The fault-tolerant Sequoia machine, a multi-processor capable of expanding to 32 processors, replaced an older system from Bull HN Information Systems, Inc.

- The **Commonwealth of Massachusetts' Office of Management Information**

Systems (OMIS) recently announced a \$1 million, three-year contract with **Bell Atlantic Business Systems Services** to maintain an IBM 3090 200E mainframe at OMIS headquarters. Officials said the move will save the state \$140,000 annually in computer maintenance costs. Under the contract, Bell will maintain tape drives, disk units and the central mainframe, which is tied into nearly all of the state's data centers. Bell Atlantic Business Systems Services, a subsidiary of Bell Atlantic Corp., is headquartered in Frazer, Pa.

- **Indonesia's Bank Niaga** has purchased an integrated set of computer-aided systems engineering tools — **Information Engineering Facility** from **Texas Instruments, Inc.** — to develop banking applications. The new software will run on the bank's **Tandem Computers, Inc.** and **IBM** mainframes, which anchor a client/server environment of personal computers running IBM's OS/2 operating system.

- **TI's Defense Systems and Electronics Group** has expanded its use of **Computervision's** computer-aided design and drafting system (CADD) by adding 68 CADD seats to its existing total of more than 100 seats. The Dallas-based electronics group signed a \$1.68 million contract with Bedford, Mass.-based **Computervision** for the new software.

- **Waste Management, Inc.** recently signed a site license for more than 3,000 copies of **Rochester Software Connection, Inc.**'s ShowCase Vista and ShowCase WindowLink data access and cooperative processing software. The software is designed to provide links between PCs running **Microsoft Corp.**'s Windows and Waste Management's IBM Application System/400 midrange systems according to Rochester, Minn.-based Rochester Software Connection.

Tandem small fish

CONTINUED FROM PAGE 75

lect billing data and host network applications, but the AT&T boxes are largely out of view. "They're going behind the curtains in a marketplace that's worth hundreds of millions of dollars," said James E. Clark, general manager of NCR Corp.'s Midrange Computer Products Division in Naperville, Ill., which resells the Tandem box for AT&T. StarServers generally run custom, not packaged, applications. "On a given project, hundreds of people could be working to develop customized applications," Clark said.

An application is up and running on six Tandem units at Bell Cellular in Toronto. Integrity hosts a graphically oriented network alarm system that is displayed on Sun Microsystems, Inc. workstations. "You can toggle up and down the alarm hierarchies to look at a whole region, or at a small part of that region," said Gina Marshall, manager of transmission systems development. Since January, the firm has installed six models.

One commercial customer is Miami-based **Royal Caribbean Cruise Lines**, which uses Integrity units as host computers on six cruise ships. **Royal Caribbean** considered other Unix machines from NCR Corp., AT&T and IBM before choosing Integrity, said John Pomeroy, manager of information technology for the line's OnBoard Systems Group. Operated by one technician per ship, the units track passengers' on-board purchases of meals,

"We could have bought two Pyramid systems, one as production and one as backup, but that is not really fault tolerant," De Meyer said, adding that the company had already used Stratus VOS-based systems for previous electronic applications.

De Meyer said the bank did not really consider Tandem Computers, Inc.'s fault-tolerant system offerings because Tandem does not have a System V Release 4 implementation of the Unix operating system — an essential requirement in the Bank Brussels network.

He added that since the 1970s, Belgian banks have made a concentrated effort to standardize business methods. Hence, roughly 67% of banking services in Belgium are conducted through electronic data interchange. De Meyer said that there are currently 6,000 companies worldwide using Bank Brussels' Telelink program.

The bank purchased three Stratus XA/R systems for approximately \$1.8 million. The systems run FTX, which is the Stratus version of the Unix operating system.

drinks and gifts after collecting point-of-sale data from about 20 personal computers on each ship. The results are downloaded to IBM Application System/400s when ships arrive in port.

The cruise line's two-year experience with Integrity has been positive. Three more units will be installed this year. "Knock on

WITH THE R3000, we're getting performance that is 50% better than before."

JOHN POMEROY
ROYAL CARIBBEAN

wood," Pomeroy said, "but it's been working out flawlessly." Still, the performance of the new models is noticeably better, he said. "With the R3000, we're getting performance that is 50% better than before." The on-board accounting application for the Integrity units was based on a hotel accounting package written by **Encore Systems, Inc.** in Atlanta.

The Integrity units have proved to be hardy in their seaborne environment, Pomeroy said: "Once, when we turned down the air-conditioning, the frost thawed, and water poured on top of Tandem machine." The computer kept running, he said.

IN BRIEF

FileNet signs ally

■ Imaging systems vendor **FileNet Corp.** in Costa Mesa, Calif., has signed a joint marketing agreement with systems integrator **Technology Solutions Co.** in Chicago, under which the two companies will provide image processing products to the manufacturing, consumer products and financial services industries.

■ **Computer Associates International, Inc.** has unveiled enhancements to three of its graphics products, including **Vivid** for VAX computers, **Tellgraf Release 7.1** and **Disspla Release 11.0**. New in **Vivid** are user interface functions including "speed keys" to get back to the main menu more quickly and support for more printers.

■ **IBM's** efforts in the Unix marketplace are making headway in large corporate accounts as its sales force pitches the **RISC System/6000** as a better choice than the **Application System/400** for client/server environments, according to a recent report from **Forrester Research, Inc.** In a survey of 51 Fortune 1,000 companies, 37% of the respondents said they expected IBM to become the leader in selling Unix as a server for personal computer clients. Sun Microsystems, Inc. and Novell, Inc. followed with 35% and 27% of the respondents, respectively.

■ **Bull HN Information Systems, Inc.** recently announced two models in its **DPX/2** line of Unix servers based on Motorola, Inc.'s 68040 processor. The **DPX/2 Model 270** and **Model 380** were designed to function as servers or front- or back-end processors for Bull HN's proprietary systems. They support X/Open, XPG3+, Posix 1003.1 and SVID specifications, according to a Bull HN spokeswoman. Model 270 will cost \$16,930, and Model 380 will be priced at \$28,030, the spokeswoman said.

DataCache shows SQL system

BY MARYFRAN JOHNSON
CW STAFF

SAN FRANCISCO — DataCache Corp. last week unveiled its **SQL DataManager Database Management System** here at the opening of **DB/Expo: Database '92**, boasting a broad performance range and linear scalability for less than \$1,300 for each transaction per second.

Designed for high-performance client/server on-line transaction processing, **SQL DataManager** is a turnkey rela-

tional database management system with micro- to mainframe-level performance scalability. The new **RDBMS** fully supports **ANSI SQL** and **Sybase, Inc.'s Open Server** and provides what company officials called an "open integration" to a broad spectrum of networks, hosts and client applications.

Transaction costs

Mainframe transaction per second ratings are about \$40,000 per transaction; midrange systems usually run from \$10,000

to \$20,000 per transaction.

The key to **SQL DataManager's** scalability is its "distributed data flow" **RDBMS** — the first of its kind to take advantage of parallel multiprocessor technology, company officials said. Both the database and its management tasks are spread out over a parallel multiprocessor array, allowing all system processors to execute database operations simultaneously across distributed databases.

Support for a wide range of networks and client front ends is

provided through tight integration with **Sybase's Open Server interface**. That integration allows **SQL DataManager** customers to choose from a range of 300 client front ends, gateways and utilities that support **Sybase SQL Server** and **Open Server**.

Networks supported through the **Open Server interface** include **Novell, Inc.'s NetWare**, **Transmission Control Protocol/Internet Protocol** and **IBM LAN Manager**.

The product is now shipping to a group of field trial customers, with general availability scheduled for June. List price for an entry-level, two-processor system begins at \$24,365.

NEW PRODUCTS

Data storage

Fujitsu Computer Products of America, Inc. has announced data compression capability for its **IBM 3480/3490-compatible** tape storage subsystems.

Fujitsu's Enhanced Data Recording Capability triples the average capacity of 1/2-in. tape cartridges, the company reported. As a result, it also raises **Small Computer Systems Interface** sustained data throughput to 4M byte/sec.

The compression system is priced at \$7,000.

Fujitsu Computer Products of America
2904 Orchard Pkwy.
San Jose, Calif. 95134
(408) 432-1300

Plasmon Data Systems, Inc. has announced a high-capacity, 5 1/2-in. optical disc jukebox.

The **RF-1020JM** handles up to 1,020 1G-byte erasable discs or 940M-byte write-once read-many optical discs. It features four multifunction drives and two cartridge pickers. It interfaces via **Small Computer Systems Interface**.

Pricing is \$233,000.
Plasmon Data Systems
1654 Centre Point Drive
Milpitas, Calif. 95035
(408) 956-9400

Applications packages

Jobscope Corp. has announced modular licensing for its **Jobscope software system** for mid-range systems.

The individual modules are **Production, Materials, Job Control, Engineering and General Accounting**. Pricing for the core modules starts at \$17,000. The **Jobscope system** runs on **IBM Application System/400** and **Hewlett-Packard Co. 3000 computers**.

Jobscope
Suite 405
355 Woodruff Road
Greenville, S.C. 29607
(803) 234-4840

DSP Development Corp. has ported **Dadisp Version 3.0** to **Silicon Graphics, Inc. workstations** and servers.

Dadisp is a technical spreadsheet for scientific analysis. It includes visual analysis tools. The **Silicon Graphics version** runs on **Iris Indigo** and **Iris 4D** systems under the **Irix** operating system.

The cost is \$4,495 for a single license.

DSP Development
1 Kendall Square
Cambridge, Mass. 02139
(617) 577-1133

Spyglass, Inc. has announced **Spyglass Transform** for the **Silicon Graphics, Inc. Iris 4D workstation** line.

Spyglass Transform is a visual data analysis tool that was previously available on the **Apple Computer, Inc. Macintosh**. Surface plots can be viewed as three-dimensional objects that users can rotate and resize via a mouse.

The program offers color raster imaging technology that allows users to examine areas of a raster image by changing color table. Users can also overlay a variety of other plot types.

Pricing is set at \$895.
Spyglass
701 Devonshire Drive
Champaign, Ill. 61820
(217) 355-6000

Ask Computer Systems, Inc. has announced **Release 8.2** of its **Manman VAX manufacturing information system**.

The upgrade incorporates 32 enhancements across eight modules, the company said. The manufacturing planning and execution module now provides centralized production routing information.

The order management and accounts receivable module allows users to designate particular products as inactive, preventing price quotations or order entries.

Pricing starts at \$39,400, depending on modules selected and system configuration.
Ask Computer Systems

2440 W. El Camino Real
Mountain View, Calif.
94039
(415) 969-4442

Utilities

Computertime Network Corp. has begun shipping **ArchiveSQL Version 2.3**.

The new release of the storage management software operates across multivendor **Unix** and **VMS** networks. Users can archive or back up files and **SQL** tables anywhere on the network, regardless of the location of the data or the storage devices. **VMS** data can be restored to **Unix** systems and vice versa, according to the company. Storage media such as magnetic disks, tape and optical discs are supported.

Pricing ranges from \$995 for a single client workstation to \$36,000 for multiuser server systems.

Computertime Network
10340 Cote de Liesse
Montreal, Quebec H8T 1A3
(514) 633-9900

R. B. Zack & Associates, Inc. has created **Xport**, a software utility that allows personal computer users to read data from **Digital Equipment Corp. VAX** and **Data General Corp. MV** systems.

Xport converts data to **ASCII** or **IBM Display Information Facility** format, allowing **PC** users to read and manipulate it. The product runs on any standard **VAX** or **MV** system.

The cost is \$3,000.
R. B. Zack & Associates
Suite 401
29000 S. Western Ave.
Rancho Palos Verdes, Calif.
90732
(310) 833-0211

DCS Software and Consulting, Inc. has announced the availability of a file compression utility for the **IBM RISC System/6000: ARCplus 6000**.

According to the company, the software can compress a 500K-byte file to as little as 80K bytes.

Pricing starts at \$950.
DCS Software and

Consulting
Suite 308
12700 Park Central
Dallas, Texas 75251
(214) 458-9711

BMC Software, Inc. has announced the availability of **Data Packer/VSAM Version 2.0**.

The compression software features improved ease of use via a **Common User Access** interface as well as improved overall performance. An option for guaranteeing registration data set availability has also been added.

Tiered pricing for a perpetual license starts at \$9,000.

BMC Software
Box 2002
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Services

SunGard Recovery Services, Inc. has announced disaster recovery service for **Hewlett-Packard Co.'s HP 3000 Series 900** family of systems.

The company supports these services via an **HP 3000 Series 960** system installed at its **Mega-Center facility**.

SunGard Recovery Services
1285 Drummers Lane
Wayne, Pa. 19087
(215) 341-8700

Database management systems

Teradata Corp. has designed an **OS/2** client interface for its **DBC/1012 Data Base Computer**.

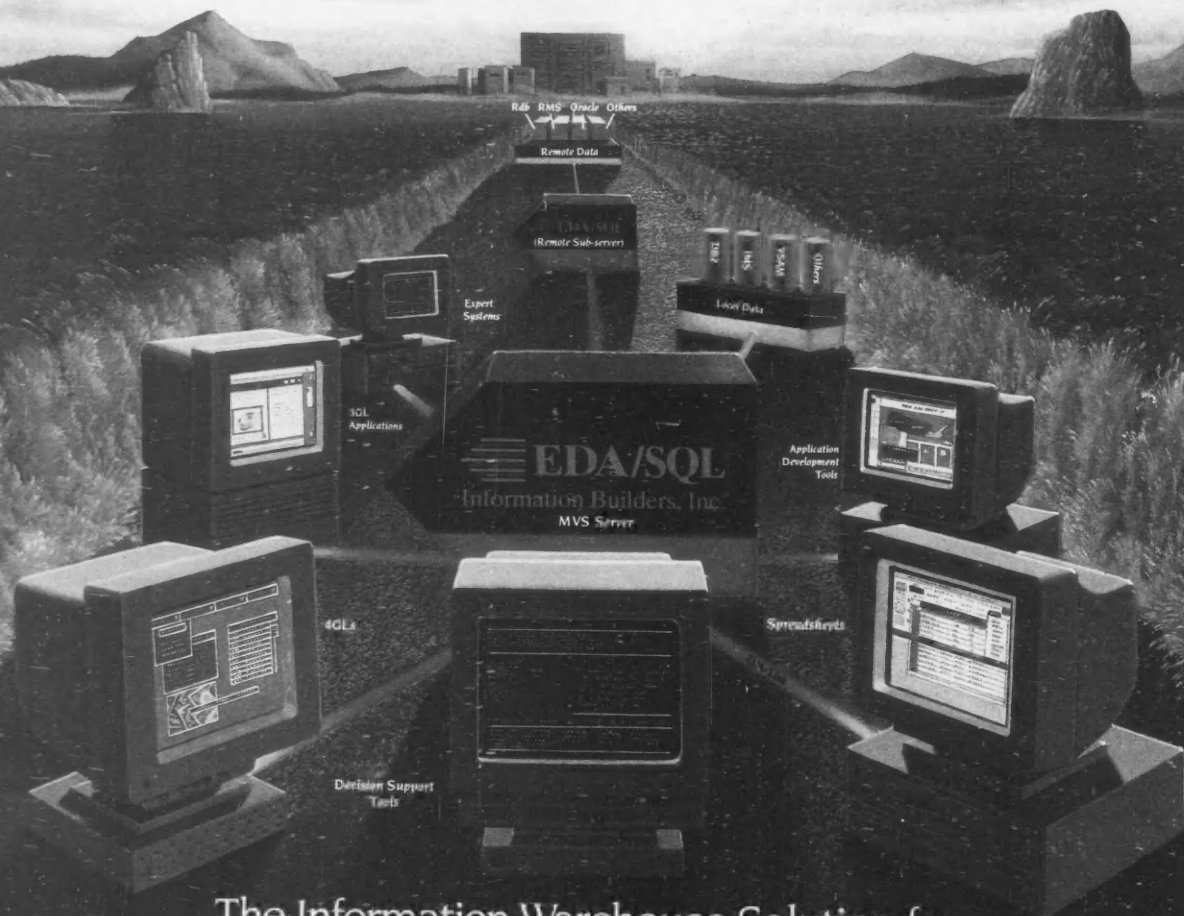
Teradata Client for **OS/2** allows users with **OS/2-based** personal computers to directly access and manipulate data on **Teradata's dedicated database server**. The software includes sample applications for **Microsoft Corp.'s Excel**.

Runtime (\$125) and Developer's Kit (\$495) versions are currently available.

Teradata
100 N. Sepulveda Blvd.
El Segundo, Calif. 90245
(213) 524-5000

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1250 Broadway, New York, NY 10001

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APPLICATION DEVELOPMENT

CASE • LANGUAGES • TOOLS

IN BRIEF

PowerTools add power

■ Santa Clara, Calif.-based **Iconix Software Engineering, Inc.** has unveiled vCASE, a capability that allows Iconix PowerTools users to access high-bandwidth data, such as animation, full-motion video and sound, in computer-aided software engineering (CASE) models. The vCASE capability was recently demonstrated at CASE World in Santa Clara.

According to the company, vCASE will allow users to easily put this high-bandwidth information at the disposal of an entire development team.

■ **Bachman Information Systems, Inc.**, the Burlington, Mass.-based CASE tool vendor, has announced a marketing agreement with New York-based **Rapid System Development, Inc.**

The agreement calls for Bachman to receive the rights to market Rapid's HyperAnalyst work-management and methodology tool via its North American sales group. Rapid will license and support the product.

Wall Data unwraps tool for Visual Basic

Rumba helps developers create graphical Windows front ends to mainframe, mini applications

BY CHRISTOPHER LINDQUIST
CW STAFF

REDMOND, Wash. — Wall Data, Inc., a software maker specializing in IBM mainframe and Application System/400 connectivity, has announced the release of Rumba Tools for Visual Basic.

The tool kit was designed to be used with Microsoft Corp.'s Visual Basic development environment to create graphical, Windows-based front ends to mainframe and minicomputer applications. The goal of the product is to help "bring corporate information to the users that need it, wherever they are," according to James E. Raisio, vice president of customer services at Wall Data, based here.

Expanded palette

The product adds four "custom controls" to Visual Basic's standard control palette. Using the controls, a developer can perform the first step in front-end development — parsing the terminal screen automatically. Text fields, PF keys and menus are translated from the original screen to a graphical representation.

"The [tool kit] provided a means of enhancing the relationship [with our customers] by making the customer more integral and strategic in developing the product," said Tim Emerson, a programmer/analyst and beta tester of Rumba Tools for Visual Basic at Northwest Air-

lines in Minneapolis.

Emerson said that developing a graphical interface is often a matter of trial and error to see

Buttons, text fields, bit maps and other features can then be added to make the screen more intuitive than a standard 3270 terminal screen.

abilities of the product.

Rumba Tools for Visual Basic is available for a list price of \$195. Rumba for 3270 and Rumba for AS/400 must be purchased separately.



Product: Rumba Tools for Visual Basic.

Vendor: Wall Data, Inc.

Features: Adds four custom

controls to the Microsoft Visual Basic palette. The tools allow quick development of graphical front ends to IBM mainframe and Application System/400 applications.
Price: \$195.

CW Chart: Janell Genovese

what works best. "How do you do this quickly?" is the question," he added. He said that in his experience with the product, Rumba spared him having to go through the laborious task of designing initial screens based on 3270 terminals and allowed him to fine-tune and mold the application to the user's needs.

Once a screen is parsed, the developer can modify it using any Visual Basic tools to customize, enhance or restrict the final user screen. Parsing is the process of translating the character-based 3270 screens into graphical elements under Windows.

RUMBA SPARED TIM EMERSON from having to go through the laborious task of designing initial screens based on 3270 terminals and allowed him to fine-tune and mold the application to the user's needs.

Emerson said Northwest is evaluating other products to perform functions similar to the Rumba tools, but "the tool, as it stands today, is a good base to start from." He also indicated a desire to see better documentation for some of the low-level

chased separately. Purchasers of Microsoft's Professional Tools for Visual Basic will receive a coupon good for an evaluation copy of Rumba for 3270 or AS/400 and a free copy of the Visual Basic tool kit. Source code samples are included.

Menswear maker to build AS/400 applications

BY SALLY CUSACK
CW STAFF

DALLAS — Haggard Apparel Co., a major national marketer of men's slacks, sport coats and suit separates, has unveiled plans for downsizing its mainframe operations in hopes of achieving greater systems integration and better all around service for its distribution centers and manufacturing facilities.

Haggard has chosen its hardware platform — the IBM

Application System/400 — and is moving into the software development stage, using a computer-aided design and engineering (CAD/CAE) package to manage the integration of existing homegrown applications.

"We're fairly typical in that we have a lot of systems of various ages, and most are not integrated," said Tom Sample, senior vice president of MIS at Haggard.

Mainframe shutdown

During the next 18 months, the company will shut down its IBM 3090 system and replace it with several IBM AS/400s.

According to Sample, the decision to move to the midrange system was based on the new software programs selected.

Haggard will be using a Busi-

ness Planning and Control System from System Software Associates, Inc. in Chicago for migrating and integrating its wide array of existing homegrown applications.

The manufacturer has also committed to System Software Associates' AS/SET CAD/CAE software package to help streamline this process.

Sample said the company also evaluated Unix-based packages for the RISC System/6000 platform but determined that

the System Software Associates product line was more suited for Haggard's particular needs.

"They offered everything from forecasting to distribution to financials, and all are completely integrated," Sample said, adding that the integration capabilities were very important in making the final selection.

Predicting that during the next year and half Haggard will have an enterprise network of six to eight AS/400 systems, Sample said that for now, the company is using an AS/400 E Model 45 for modifications and prototyping.

Haggard has purchased 28 modules from System Software Associates and will be working with the software vendor's Dallas-based affiliate, Priority Systems, Inc., on the migration.

Dangling CASE users to get support

BY KIM S. NASH
CW STAFF

WILSONVILLE, Ore. — About a year after Mentor Graphics Corp. dropped out of the computer-aided software engineering (CASE) business, the firm has made definitive moves to take care of its existing application development customers.

Mentor's installed base of 500 to 600 CASE Station users will now get care and feeding — and a migration path — from Interactive Development Environments in San Francisco.

Cadre Technologies, Inc. in Providence, R.I., has also signed up to service and convert CASE Station users and last week announced a trade-in program for Mentor users. However, Mentor "will work more closely with IDE," said Phil Robinson, presi-

dent of Mentor's Concurrent Engineering Group.

In search of partners

Mentor changed its corporate philosophy about 18 months ago, when it started its Open Door Program. The company, based here, decided that it needed partnerships with competitors because it lacked human and monetary resources to develop strong products in certain markets: CASE, mechanical design and document management software, Robinson said. Now Mentor will concentrate on enhancing its electronics business.

"We wanted to be deeper in a few areas rather than thin in many areas," he said.

Interactive Development Environments makes Software through Pictures and the C Development Environment, two in-

tegrated CASE suites for building Unix-based applications. Revenue for the 9-year-old firm topped \$22 million last year.

Interactive Development Environments is pushing to expand its installed base of 900 and has outlined a plan for users to migrate from CASE Station tools to Software through Pictures.

It has already identified a few sites that are ripe for migration, according to a company spokesman. However, he said he anticipates that the general changeover will be slow because users now in the middle of CASE Station development projects will likely complete them before converting to another CASE tool.

Most of Mentor's CASE clients are reportedly in Europe. However, the two companies have yet to iron out the details of any European agreements.

Integral adds Synon's tools

WALNUT CREEK, Calif. — Users of Integral Systems, Inc.'s manufacturing software will be able to modify and add functionality to those packages via application development tools from Synon, Inc.

Under the terms of a deal struck between the two firms, Integral will sell Synon/2E and 2G tools with just-in-time, quality assurance, materials tracking and other plant management applications "to help such users decrease software maintenance costs," said John DeWitt, a vice president of marketing at Synon.

Users will be able to modify an off-the-shelf program without writing new code, he said. Through a series of menus, users can also define the functions they want to add, and Synon/2E and 2G will generate the appropriate code. This allows for fewer coding errors and more consistent documentation, DeWitt added.

Integral may bundle Synon — or other computer-aided software engineering (CASE) vendors' tools — with other products. In February, Integral announced that it will develop new client/server human resources and financial applications using CASE products from Synon, Knowledgeware, Inc. and Bachman Information Systems, Inc. Integral was unavailable for comment at press time, but DeWitt said he saw no reason that bundling could not happen.

KIM S. NASH

DEC programs offer Windows

MAYNARD, Mass. — Digital Equipment Corp. has provided systems integrators and developers with additional capabilities by extending the application integration functions of its object-oriented Application Control Services, or ACA Services, programs.

By offering support for Microsoft Corp.'s Windows 3.0 and Sun Microsystems, Inc.'s SPARCstation platforms, Version 2.1 of ACA Services can now be used more effectively in electronic publishing, computer-integrated manufacturing and computer-aided software engineering applications, the vendor said.

ACA Services was designed to enable businesses to integrate both new and existing applications in a multivendor environment without rewriting application source code.

It is part of DEC's Network Application Support strategy, which provides object-oriented software products for cross-platform, mixed-vendor application integration. The previous version provided support for DEC's proprietary VMS platforms, as well as Ultrix-based applications.

The latest release also supports industry-standard Transmission Control Protocol/Internet Protocol and DECnet/Open Systems Interconnect network transports.

Scheduled for availability in May, ACA Services Version 2.1 will be priced from \$100 per individual user license.

SALLY CUSACK

Must enhances Nomad 4GL line with query tool

Accesspoint allows users to query SQL-based data without prior knowledge of commands

BY ROSEMARY HAMILTON
CW STAFF

NORWALK, Conn. — Must Software International said last week that it will extend its Nomad fourth-generation language product line with the addition of Accesspoint, a Microsoft Corp. Windows-based query tool.

Must Software, located here, will resell the query tool, which is made by Viewpoint Systems. It also resells Flashpoint, another design tool from Viewpoint, for the Nomad environment.

Accesspoint is made up of three components: a workstation module, a server and communications programs.

At the workstation level, users can construct queries to SQL-based data in the point-and-click process of a graphical user interface environment.

No experience required

It is not necessary for users to know SQL commands. Instead, a SQL query is generated with a corresponding click of a mouse.

The server component provides ad-

ministration tools to establish data access rules. It includes LU6.2 communications support to access host-based servers as well as NetBIOS for local-area network servers.

Currently, Accesspoint can develop queries for IBM's DB2, Gupta Technologies, Inc.'s SQLBase, Microsoft's SQL Server and Sybase, Inc.'s SQL Server.

Must Software will begin shipping Accesspoint this week. A host license ranges in price from \$60,000 to \$80,000, depending on the configuration. A single client module can be licensed for \$595.

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The chip, in turn, could be won by you — along with the computer it goes in.

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*Benchmark published in the AIM UNIX SYSTEM PRICE PERFORMANCE GUIDE, WINTER 1991-1992. Winners will be selected from among all eligible entries received in a random drawing. Families (spouse, son, daughter who reside in the same household) of Motorola, its divisions, subsidiaries, affiliates, advertising and promotion agencies are not eligible to participate. Network

NEW PRODUCTS

Development tools

Etak, Inc. has announced an enhanced version of its MapAccess Development Tools. The tool kit comprises a set of C language libraries for creating road map-related applications. The new version offers improved detail and enhanced graphics handling.

MapAccess Development Tools are available for personal computers and Unix systems. An annual license costs \$9,500.

Etak
1430 O'Brien Drive
Menlo Park, Calif. 94025
(415) 328-3825

Highland Technologies, Inc. has released HighVIEW/SQL for Windows, an imaging application development system.

HighVIEW/SQL for Windows offers a standard development interface that has the ability to support Microsoft Corp.'s Windows functions, including Dynamic Data Exchange.

Users can build client/server applications with functions including scan, file, index and retrieve.

The developer's version costs \$1,595.

Highland Technologies
Suite 505
7701 Greenbelt Road
Greenbelt, Md. 20770
(301) 345-8200

EMS Professional Shareware has announced an expanded version of VBASIC Library, a collection of shareware programs and utilities for use with Microsoft Corp.'s Visual Basic.

The library includes 225 compressed programs, utilities and file collections with a Microsoft Windows-based database directory. The product is priced at \$59.50.

The company also announced a new edition of the DOS Utility Library, which contains 339 programs and utilities for personal computer support and troubleshooting. It is also priced at \$59.50.

EMS Professional Shareware
4505 Buckhurst Court
Olney, Md. 20832
(301) 924-3594

SofDesign International, Inc. has begun shipping ProVision:Windows Version 1.01.

ProVision:Windows is an interface development library for use with Nantucket Corp.'s Clipper. The new version is completely object-oriented.

The product costs \$199. Registered users will receive a free upgrade.

SofDesign International
Suite 209
1303 Columbia Drive
Richardson, Texas 75081
(214) 644-0098

Database management systems

Pioneer Software has released Q+E Database/VB.

The product provides database custom controls for developers working in Microsoft Corp.'s Visual Basic environment. It generates interface features such as text boxes, check boxes and scroll bars that automatically access database data.

Q+E Database/VB costs \$199.

Pioneer Software
Suite 324
5540 Centerview Drive
Raleigh, N.C. 27606
(919) 859-2220

Utilities

AnSoft, Inc. has developed the PGL ToolKit, a set of graphics libraries for producing high-resolution printer output.

Six languages are supported by the tool kit, including C, Basic and Fortran. The libraries can be integrated with any screen graphics library, and they provide control over printer functions such as margins, page orientation, resolution and reverse image printing.

The PGL ToolKit costs \$195.

AnSoft
8254 Stone Trail Court
Laurel, Md. 20723
(301) 470-2335

Computer-aided software engineering

LBMS, Inc. has announced SE/Linc Up, an interface between the company's computer-aided software engineering (CASE) tool and Unisys Corp.'s Linc II development environment.

SE/Linc Up runs under Microsoft Corp.'s Windows. It allows Linc II developers to use the LBMS Systems Engineer CASE tool during the early stages of the development life cycle.

SE/Linc Up costs \$10,000 for a site license.

LBMS
Suite 1800
1800 West Loop South
Houston, Texas 77027
(713) 623-0414

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MOTOROLA

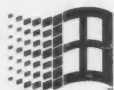
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Product Showcase.

Page 108



WINDOWS[™] WORLD Open

Computerworld's Custom Application Contest 1992

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See Their Applications

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Finalists from the WINDOWS WORLD Open, Computerworld's Custom Application contest will be running their applications live on the WINDOWS WORLD show floor, at the WINDOWS WORLD Open Booth, April 6-9. Learn from your colleagues how they put Windows to work in their organizations. The 21 finalists include:

- Blue Cross Blue Shield of Michigan
- The Prudential
- Connecticut Mutual Life Insurance Company
- Naval Electronic Systems Engineering Activity
- Edmonton Public Schools
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- NCR Organization
- Sun Hydrolics Corporation-Sun Optech Group
- Otis Elevator
- Orlando Health Care Group
- Loral Aerospace
- Full Circle Computing
- PHH Fantus
- Ansett Airlines
- General Electric/Power Generation
- Con Edison
- OTC
- Chevron Information Technology Company
- Revco D.S. Incorporated
- Bightridge Solutions
- University of Connecticut Health Center/University Physicians

Join us in saluting the winners in a special ceremony on April 7, at 3:30 p.m. in the McMahon Room (McCormick Place).

Bill Gates, CEO of Microsoft, will announce the winners and highlight their applications.



Floor plan, route to WINDOWS WORLD Booth #W 224
McCormick Place-North Building, Upper Level

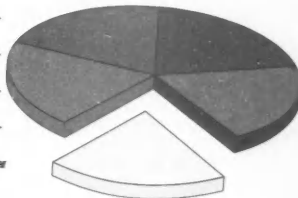
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 - 23. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm.
 - 24. Network Sys. Mgt.; LAN Mgr.; PC Mgr.
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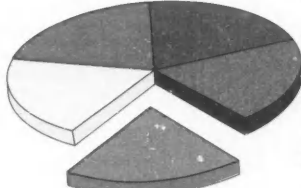
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 - 70. Communications Systems/Public Utilities/Transportation
 - 80. Mining/Construction/Petroleum/Refining/Agric.
 - 90. Manufacturer of Computers, Computer-Related Systems or Peripherals
 - 95. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
 - 96. Computer/Peripheral Dealer/Distributor/Retailer
 - 97. User/Other
 - 98. Vendor/Other

(Please specify)

2. TITLE/FUNCTION (Circle one)
- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/Asst. VP
 - 21. IS/MIS/DP Management
 - 22. Dir./Mgr. MIS Services, Information Center
 - 23. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm.
 - 24. Network Sys. Mgt.; LAN Mgr.; PC Mgr.
 - 25. Dir./Mgr. Sys. Development, Sys. Architecture
 - 31. Programming Management, Software Developers
 - 60. Sys. Integrators/VARs/Consulting Mgt.
- OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
 - 12. Vice President, Asst. VP
 - 13. Treasurer, Controller, Financial Officer
 - 41. Engineering, Scientific, R&D, Tech. Mgt.
 - 51. Sales & Mktg. Management

OTHER PROFESSIONALS

- 70. Medical, Legal, Accounting Mgt.
- 80. Educator, Journalists, Librarians, Students
- 90. Others

(Please specify)

3. IS INVOLVEMENT (Circle all that apply)
- Please indicate your involvement in IS/MIS/DP.
- A. Manage/Supervise IS/MIS/DP Staff
 - B. Recommend/Specify IS Equipment
 - C. Purchase IS Equipment
 - D. End-user of IS Equipment
 - E. No Involvement

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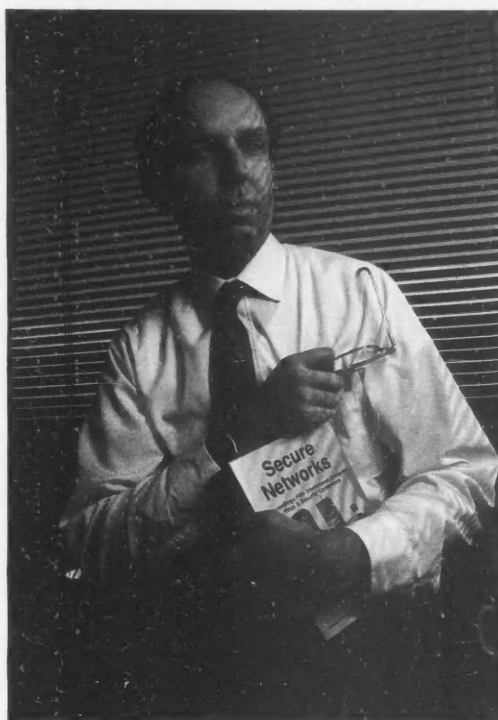


EXECUTIVE REPORT

WHEN SYSTEMS FAIL

It's C.Y.A. time

As courts increasingly hold firms liable for losses caused by computer system errors, IS pros may find themselves on the hot seat — or worse



Rob Nelson

Sun Trust Banks' Wylder: *His IS group requires a handwritten sign-off by end users before new systems are booted up*

BY JULIA KING

Consider three real-life technology nightmares:

In February, hackers penetrate the computer network of Atlanta-based Equifax, Inc., a major credit reporting bureau that sells 450 million reports annually. Consumers' files, credit card numbers and other confidential information are accessed.

A computer system at Shell Pipeline Corp. fails to detect human operator errors. As a result, 93,000 barrels of crude oil are shipped to the wrong trader. Cost of the error: \$2 million.

A software bug causes a Therac 25 therapeutic radiation machine to deliver a lethal dose of X-rays, killing a 33-year-old Texas oil field worker.

A decade ago, courts seemed content to chalk up such disastrous computer-related problems to acts of God. But today, thanks to the personal computer explosion and a dramatic rise in computer lit-

TODAY, THE JUDICIAL system isn't so awestruck by information technology.

with Dayton, Ohio, police officials to locate the hackers. A company spokesman says the Atlanta-based agency is assessing damages and investigating which files were accessed. When finished, it will notify individuals whose files were violated.

Yet computer lawyers and others say the growing tendency to hold companies liable for system errors leaves IS organizations more vulnerable to liability than ever before. Further fueling the trend is a huge leap in system complexity and a widespread shift to open computing environments.

For computing professionals, this can mean lost credibility, lost jobs, shattered reputations and maybe even ruined careers (see story page 86).

"If you're in the computer business, the question now isn't how you'll get sued but when," warns August Bequai, an attorney in McLean, Va., specializing in computer law. Over the next few years, Bequai predicts, one out of six corporate IS organizations will be involved in a lawsuit.

Yet in the face of such exposure, industry experts say many IS departments have yet to

eracy, the judicial system isn't so awestruck by information technology.

"Today, with computers controlling almost everything," says Susan Nycum, an attorney in Palo Alto, Calif., specializing in computer law, "there's a tendency for courts not to excuse the computer but to hold responsible those in control of it."

Computers, experts say, have come to be regarded in much the same way as any other tool — and that can spell bad news for information systems professionals and their firms. As consumers, businesses and courts look to assign blame in cases where technology runs amok, firms may increasingly find themselves liable for errors caused by faulty software and systems.

Take the 1990 Shell case. The liability of Houston-based Shell was based on a human error made by a computer operator who entered inaccurate data for an oil transfer into the computer system, says Jay Westemeier, a Washington, D.C., attorney and computer law specialist. The court based the \$2 million award in part on Shell's "failing to design a system . . . that would prevent the possibility of misdeliveries."

In the Equifax case, the outcome is not yet clear. Company officials say they are working

with Dayton, Ohio, police officials to locate the hackers. A company spokesman says the Atlanta-based agency is assessing damages and investigating which files were accessed. When finished, it will notify individuals whose files were violated.

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Continued on page 86



Liability

KEY POINTS

► Many IS organizations are unaware of this issue. Some pioneers, such as Chase Manhattan Bank and Sun Trust Banks, have put protective policies in place.

► While the issue is still new, outsourcing vendors in most cases have little liability if disaster occurs (see story page 88).

► The number of IS managers who actually lose jobs because of system failure is believed to be small. But such layoffs do occur (see story page 86).

► Membership in professional associations can actually increase liability for programmers, analysts and other IS professionals (see story page 86).

► To reduce liability, experts suggest negotiating vendor contracts with an eye toward liability. Also recommended are airtight internal procedures for protecting data (see story page 90).

QUOTABLE:

"By no stretch of the imagination do IS professionals comprehend the gravity of potential consequences."

Tari Schreider
Contingency Planning

King is a free-lance technology writer in Ridley Park, Pa.

No safety in numbers

Bad news, liability-shy computing professionals: There is no safety in numbers.

By signing on as members of professional IS associations, thousands of programmers, analysts and others may have unwittingly made themselves liable for mistakes they make on the job.

Moreover, computer law experts say, these same workers could now be slapped with malpractice suits, just as lawyers or physicians who agree to abide by professional standards set by the American Bar Association and the American Medical Association.

"Organizations like the Association for Computing Machinery or the Data Processing Management Association have codes of ethics to which members voluntarily subscribe," explains Daniel Brooks, a Washington, D.C., attorney and computer law specialist. "Because these codes hold members to certain professional standards of conduct, it makes a signed membership card a nail in the coffin when it comes to proving liability."

While few and far between, cases do exist in which individual IS workers have been held to professional standards and their companies sued for damages they caused.

The most famous is a 1989 case in which Ernst & Whinney was ordered to pay a client \$82,500 after a computer system recommended by one of its IS consultants failed to meet the client's needs. Ernst & Whinney had nothing to do with designing, programming or selling the computer system.

Still, the consulting firm was held liable for damages because its IS consultant had agreed to an internal policy that included professional standards set forth by the American Institute of Certified Public Accountants.

Given the increasing number of professional standards the IS community has set for itself, experts say a court today would have little problem nailing individual IS workers for hardware and software malfunctions. "At this point, there is a pretty defensible argument that there are industry standards that IS professionals are expected to follow," says Richard Bender, a Larkspur, Calif.-based consultant.

"We may only just be seeing the beginnings of software liability cases, but in my opinion, they will stick," Bender predicts.

Ralph Jones, president of the 20,000-member DPMA, says he is unaware of any cases in which an IS worker has been held liable for errors. The association's code of ethics is meant to be enforced internally by DPMA tribunals, not in the courts, Jones says.

JULIA KING

Courts hold firms liable for losses caused by computer system errors

CONTINUED FROM PAGE 85

seriously address the issue of liability. Others remain unaware of any danger.

"IS managers are not taking steps to minimize liability, primarily because they don't, at the moment, see a lot of companies getting sued," says Richard Bender, a Larkspur, Calif.-based consultant who specializes in software testing and quality assurance. Most liability cases have a very low profile, Bender says.

"A lot of cases that look really interesting never come to fruition and are settled without judgments," adds Donn Parker, a senior management consultant at SRI International in Menlo Park, Calif., who has been tracking systems liability cases since 1958.

There's one other factor contributing to the overall poor track record of U.S. companies in addressing the technology liability issue, Bender says. That is "an attitude in the industry that software inherently has bugs and that bugs are the cost of doing business."

Despite a past lack of interest, many IS organizations find themselves encountering the technology liability issue face-to-face.

Beverly Lieberman, president of Halbrecht, Lieberman and Associates, an IS recruiter in Stamford, Conn., says accountability is higher in companies with separate IS subsidiaries, IS profit and loss centers and chargeback operations. And increasingly, the concern is both for the computer systems themselves and the data that they contain.

A new issue

Up until a few weeks ago, says Bob Hoadley, director of data processing for the city of Raleigh, N.C., liability was not a concern for him or his department. Since all data maintained by the city is public, what was there to worry about? Then last month, the local newspaper requested terminal access to the city's database.

Now, Hoadley says, he is beginning to see things differently. He is carefully examining his department's role and responsibilities in protecting the city against potential liability suits.

Whether the newspaper's request for electronic access will be granted has yet to be decided. But the questioning has begun. "On the surface, all of our records may be public, but what about information we are obligated to keep confidential?" Hoadley asks.

Understandably, he says, "Liability is just beginning to be an issue for us."

And a sticky issue it is. Depending on the industry, dozens, even hundreds, of liability laws might apply. Banks and credit bureaus, for instance, are subject to specific regulations under truth-in-lending and fair credit reporting regulations. That's on top of privacy and product liability laws that apply to all companies. Still, general rules of thumb do exist (see story above).

Smart companies

Prudent companies are acting before disaster strikes. Sun Trust Banks, Inc. in Atlanta has instituted "rigorous" regulations governing the testing and imple-

mentation of new systems, says John Wylder, group vice president.

For example, a handwritten sign-off by end users is required before any new system can be booted up. The IS department also offers warranties to end users, a policy that encourages both IS workers and end users to test, then retest new systems.

Two golden rules

Computer law experts say two liability rules of thumb generally apply to all IS professionals and organizations.

Rule 1. Closeness counts. This holds that the person closest to the data is in the best position to control errors. Thus, he is also most accountable for them. In cases where data has been irretrievably lost or errors have caused substantial financial losses, managers say IS workers have been known to lose their jobs.

Rule 2. Purchase equals responsibility. Once a system is accepted from a vendor, the accepting party is responsible for any problems the system may cause. Translation: You buy the system AND any problems it causes.

"After IS completes a project, if a user finds any defect against original specifications, IS will correct it without charge," Wylder explains.

Experts say policies such as these also go a long way toward establishing that an IS department has taken "due care" to minimize system errors. That's important, they note, because these policies are used by courts to determine liability.

At Chase Manhattan Bank Corp. in New York, Emil D'Angelo, vice president of information security, says the ongoing process of establishing a due care standard begins with setting a companywide

information policy.

The policy being developed by Chase includes procedures for developing, accessing and testing systems. Once the policy is implemented, employees will be required to sign it annually.

"Unless you have policies in place," D'Angelo explains, "and these have been communicated to and acknowledged by employees, there is very little you can do to enforce security or accountability."

For now, he adds, "our policies are at a level of trying to get employees to understand their responsibilities." Eventually, IS workers will be held to a standard of "due diligence" in performing their jobs.

"Just like a mechanic fixing a car has a responsibility to put parts on and tighten them appropriately, the IS employee has to do their job with due diligence," D'Angelo reasons.

At Chemical Waste Management, Inc. in Oak Brook, Ill., IS director Mike Hansen says his company does not go "so far as to censure people for errors that result in the loss of integrity of data."

What the firm has done is set a zero defects goal for every IS worker. Under this policy, each worker's performance is reviewed annually. "It is kind of a soft response to the liability issue," Hansen says. Yet the company is holding employees accountable for job performance, he notes.

Until now, companies have "just been lucky" with liability issues, says Richard Bernacchi, a Los Angeles attorney specializing in computer law. Most system-based errors have resulted in relatively trivial problems.

Perhaps, attorney Nycum says, that's why IS organizations haven't been more concerned with liability. Companies "have to hear a lot of bad things that happened to other people before they protect themselves," she says.

Or maybe companies haven't paid great attention to the issue because "none of what is involved in minimizing liability pumps products out the door," Nycum adds.

That, experts predict, will change. •

Do people lose jobs over this?

Most liability cases are settled behind closed doors to avoid negative publicity. But behind those doors, experts say, individual IS employees are paying for computer-related business disasters, though opinions differ on how often firing occurs.

For example, Tari Schreider, chief executive officer at Contingency Planning Research, Inc. in Jericho, N.Y., says he knows of at least five IS workers who were fired by financial institutions following one New York City power outage because data was irretrievably lost.

In another case, also in New York City, an IS vice president was fired after a system outage caused the loss of two major customers and \$10 million, according to Schreider.

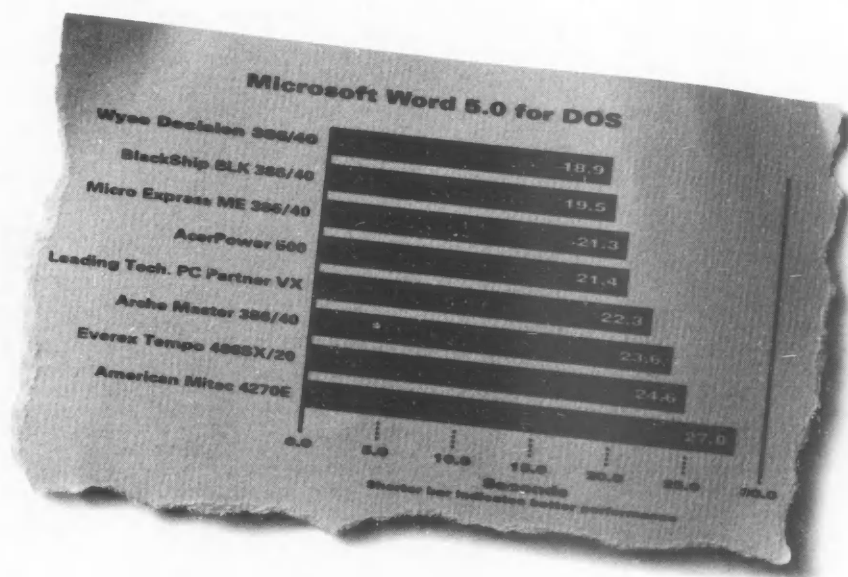
"By no stretch of the imagination do IS professionals comprehend the gravity of potential consequences," he says. "The problem is that most people keep it hushed up."

Despite such cases, it's relatively rare for an employee to be fired for making a computer mistake, even one that costs a company money, according to Beverly Lieberman, president of Halbrecht, Lieberman and Associates, an IS recruiting firm in Stamford, Conn.

"In general, terminations have to do with repeated performance problems rather than a one-time, ghastly error," she says.

One case Lieberman has seen involved a computer operations manager who was fired after a power outage shut down systems and he didn't have a disaster recovery plan in place. But such stories are the exception, she says.

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Outsourcers have limited liability

Don't expect to pin information errors on anyone but your own company, law experts say

BY EMILY LEINFUSS

Outsourcing information systems operations means entrusting someone else with your company's data. But if you think you're also transferring the liability for that data, think again.

While the outsourcing field is still in its infancy, experts say the deck is stacked against you. Unless the outsourcer is blatantly negligent, abuses information or has negotiated a particular liability in writing, there is very little for which outsourcing vendors can be held liable.

"The outsourcer will not take the position that they are responsible for lost savings or profits" that result from information errors, according to Robert E. Zahler, a leading authority on outsourcing law and a partner at Shaw, Pittman, Potts & Trowbridge in Washington, D.C. "The contracts are very clear on that."

Zahler says the courts have held the outsourcer liable for damages in only a

handful of cases. Those usually involved misrepresentation and small companies.

The only wise thing to do in such circumstances is get a clear understanding early in the process, says Larry Liss, senior vice president of operations and technology at Meritor Savings Bank in Philadelphia. Meritor outsources its systems to Electronic Data Systems Corp.

"It is a question of whether [the outsourcer] followed appropriate procedures — whether they did everything they were supposed to or [that] could be expected of a professional organization," Liss adds.

Liss says there will always be day-to-day software and hardware problems, so he doesn't blame the outsourcer when minor hassles crop up.

Ready just in case
Louis Olenick, a partner at Olenick & Yarnell, a New York-based law firm specializing in computer law, says it's important to arrange contractually for the damages that really matter to your company.

For instance, if processes must be performed a certain way, you can include that information in the contract as an objective measure of how well the contract terms are being met, Olenick explains.

Most outsourcing contracts identify financial implications of failures to meet agreed-upon terms, says Ladd Willis, managing vice president at First Manhattan Consulting Group in New York. Thus, it is important to accurately assess the value of your data and to determine potential damage if things go wrong.

Then, if your company starts losing

money because computer operations go down for a week, for example, you can still make demands, regardless of whether it is the outsourcer's fault.

Negotiating a solid contract is tough, says Fred Cisewski, senior vice president

and director of IS at Bank South Corp. in Atlanta.

"It is a sticky issue. You have to put yourself in the situation and say, 'If I were running the operations myself, how much self-insurance do I have?' Then you have to make sure that the contract is structured to manage those risks through the outsource vendor."

Don't expect too much
For their part, vendors say that companies moving to outsourcers have to be realistic.

Clients must have reasonable expectations or demands, says Nick Houpis, a Digital Equipment Corp. spokesman.

For instance, companies cannot expect

the outsourcing vendor to assume responsibility for unforeseeable events or to approve a contract that asks the vendor to take on a problem that the company would have to face anyway.

"The lawyers do the work and make sure the relationship is sound on both sides," Houpis says. "But there is a lot of good faith activity on both sides."

Not blind faith
But good faith does not mean you should accept an outsourcing vendor's contract terms without question, cautions Perry Harris, senior analyst at The Yankee Group in Boston.

"Many outsourcers have been in business for 20 years and know how to structure contracts to favor themselves and their ability to perform," he says.

Harris recommends assembling a group consisting of IS staff members, management, internal counsel and outside experts in outsourcing conduct. This team would then review the deal with an eye toward technology performance, skill sets, availability, pricing, amount and volume of work and other similar considerations.

Keep in mind, too, that no contract will be perfect, says J. P. Richard, vice president at Input, Inc. in Vienna, Va.

"It is very difficult to predict all the problems and even harder to get airtight clauses written into contracts," he says.

Leinfuss is a free-lance writer based in Sarasota, Fla.



Bank South's Cisewski: "You have to make sure that the contract is structured to manage... risks"

Best-, worst-case scenarios

What are your chances of pinning liability for damage on your outsourcing vendor?

Not great, according to experts in outsourcing law. Below are two typical scenarios and what lawyers say are their likely outcomes:

Case 1: You've outsourced operations, and a hacker infiltrates the system, destroys vital data and costs your firm a week's worth of operations.

Likely outcome: The outsourcer might have to replace the data, but you're probably out of luck for the lost operations.

Case 2: Your outsourcer makes an outright mistake in data processing, and your company loses money.

Likely outcome: You will probably be able to recoup only a portion of the losses. The vendor must replace the work, but it isn't responsible for the fi-



nancial damage caused.

Case 3: You are a bank whose outsourcer didn't complete the nightly processing on time. As a result, you miss the deadline to get the required cash letter out to the Federal Reserve Bank. Thus, the bank loses money by missing the "float."

Likely outcome: The vendor, while responsible for the processing, would not be liable for lost profits. The reason: The loss is considered a "consequential damage."

PUBLICATIONS

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REPORTS/ARTICLES/BOOKS

"Computers Under Attack," P.J. Denning, editor, ACM Press, 1990.

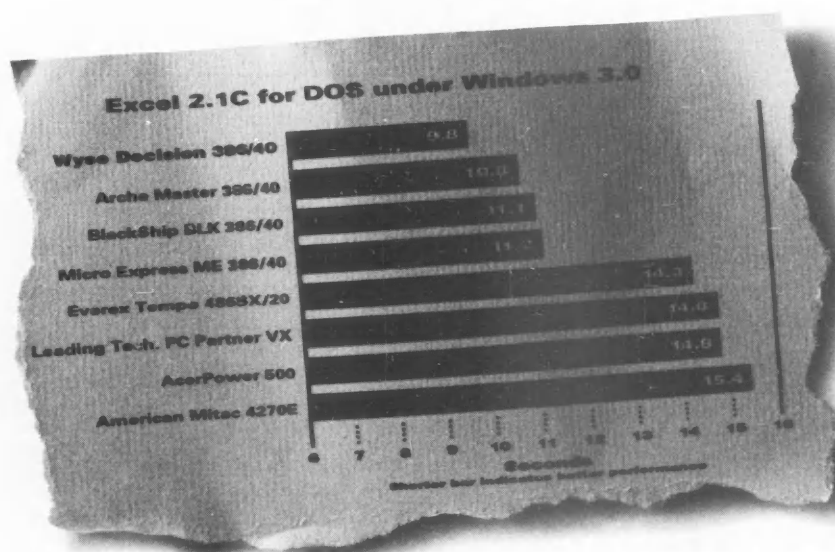
"Do laws protect wireless nets?" By Mitch Betts, *Computerworld*, June 17, 1991.

"Electronic Mail: Setting ground rules for privacy." By Christine Casatelli, *Computerworld*, March 18, 1991.

Information Protection and other Unnatural Acts: Every Manager's Guide to keeping Vital Computer Data Safe and Sound. By Harry B. De Maio, Amacom Books, 1992 (\$24.95).

"Plumbing the soul of IS: 'Computers and society' proponents question social consequences of new technology." By Mitch Betts, *Computerworld*, Oct. 29, 1990.

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Negotiating your company to safety

Smart firms are protecting themselves by inserting liability clauses into vendor contracts

BY JULIA KING

Terry Nixon isn't taking any chances. If his new computer hardware or software causes problems after it's rolled in the door, he uses the law to guarantee that vendors will take their fair share of blame.

"Because liability can be so difficult to prove, we felt it necessary to take contractual steps to protect ourselves," explains Nixon, vice president of information systems at Air and Water Technologies, Inc. in Branchburg, N.J.

Because corporate information systems and networks include third-party hardware and software, no IS organization has complete control over system quality. That's why computer attorneys and other experts say it's critical that IS managers negotiate vendor contracts with a keen eye toward liability.

There's a limit

Typically, hardware and software vendors protect themselves up front by limiting their liability in purchase agreements. However, computer lawyers say this practice shouldn't dissuade IS organiza-

tions from aggressively negotiating liability and insisting on clauses that will protect their companies.

Air and Water Technologies, a diversified environmental services company, recently incorporated "specific language" in all of its contracts that holds providers liable for hardware or software errors, Nixon says.



Elsewhere, attorneys say, companies have insisted that vendor contracts include clauses guaranteeing that new systems are virus-free.

On their own, such clauses probably aren't enough to protect a firm against liability, however. Lawyers say companies

must also take their own measures to protect systems and data.

Dumb and happy?

Consider, for example, the threat posed by the recent Michelangelo computer virus.

"Since there was so much publicity about that virus, anyone with data that could have been corrupted had the duty to protect it," says Susan Nycum, a Palo Alto, Calif.-based attorney specializing in computer law. "A company can't just sit

there fat, dumb and happy waiting for a virus to walk in on it. Both sides must be careful to take protections," she adds.

According to Nycum, not doing so is "like an airline not conducting a search after receiving a bomb threat. Knowing a virus will happen and not taking all possible steps to evade it is a fairly straightforward case of negligent liability."

Sylvia Khatcherian, a New York City attorney and computer law specialist, says success in contract clauses depends on the particular product, its cost and the user's negotiating strength.

Especially important in any contract, according to Khatcherian, are provisions

dealing with third-party liability, which has the potential to be economically devastating.

For now, attorneys say there are no hard and fast rules regarding third-party liability for information products and services. That's one reason why such clauses are so hotly debated during contract negotiations.

Eventually, however, a precedent will be set on whether conventional product liability laws — which allow third-party damages — apply to information-based products and services. But experts say this could take as long as 15 years.

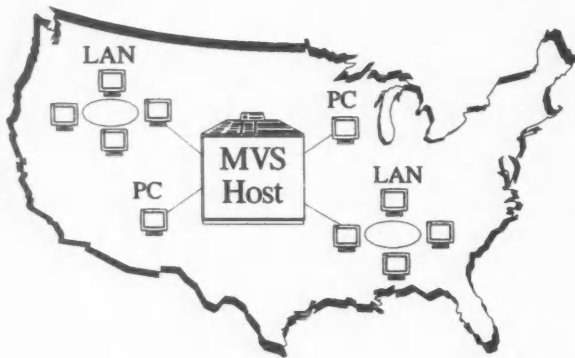
Until then, attorneys advise IS to negotiate, negotiate, negotiate.

"The odds are very good that unless something is specifically written into a contract, a vendor has no liability," notes Richard Bernacchi, a Los Angeles attorney specializing in computer law. •

Tips for reducing your liability

- Spell out liability for specific errors in vendor contracts.
- Coordinate business errors and omissions insurance in order to cover the broadest spectrum of potential system errors.
- Establish internal procedures for accessing and protecting data as a way to establish a standard of "due care."
- Carefully consider the liability implications of vendor requests for indemnifications for particular kinds of errors or claims.
- Identify which users and systems are likely to be risky, and take necessary corrective actions.
- Require vendors to show quantifiable results of software code tests.

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Check that check

► Image technology can be a boon to the financial services industry. However, a recent report by the American Bankers Association warns that Magnetic Ink Character Recognition laser printing has created the need for several new and revised technology standards. "Anyone with access to a laser printer and the proper computer software can create his own checks, increasing reject rate and fraud opportunities," the report warns. The committee is working to strengthen standards and guidelines to help banks make sound decisions about their check printers. For more information, call Cynthia L. Fuller at (202) 663-5284.

Going global

► Security is a global issue, says Mike DeFazio, chairman of the Information Technology Association of America Computer and Network Security Committee. The committee created an International Information Security Foundation earlier this month. The agency encourages world governments to cooperate in developing international data security standards. "Governments can't operate in the vacuum of their own country," DeFazio says. "Information security has to be global."

EC debates data protection

► A European Community (EC) directive on the protection of consumer data and computer security is entering its final phase. Debate on the issues dominated the recent Paris Securicom confer-

ence. Lobbying groups made more than 200 amendments. Critics say certain directives don't cover all groups. Also questioned were proposed regulations for data transfer over national boundaries. Computer security also loomed large. A 1991 joint initiative from France, Germany, the Netherlands and the UK established the Information Technology Security Criteria for the EC. Financing approved Feb. 25 will give \$15 million toward creating a commission that will study risk analysis, standardization and evaluation of security systems.

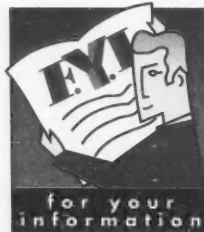
Finns rethink laws

► Finnish authorities say they are finding that overly strict data protection regulations hinder their work and cause unnecessary bureaucracy. Data protection authorities recently blocked the National Pension Institution and police from uniting their identity cards, halting years of preparation. Deputy government councillor Kirsti Vihermaa

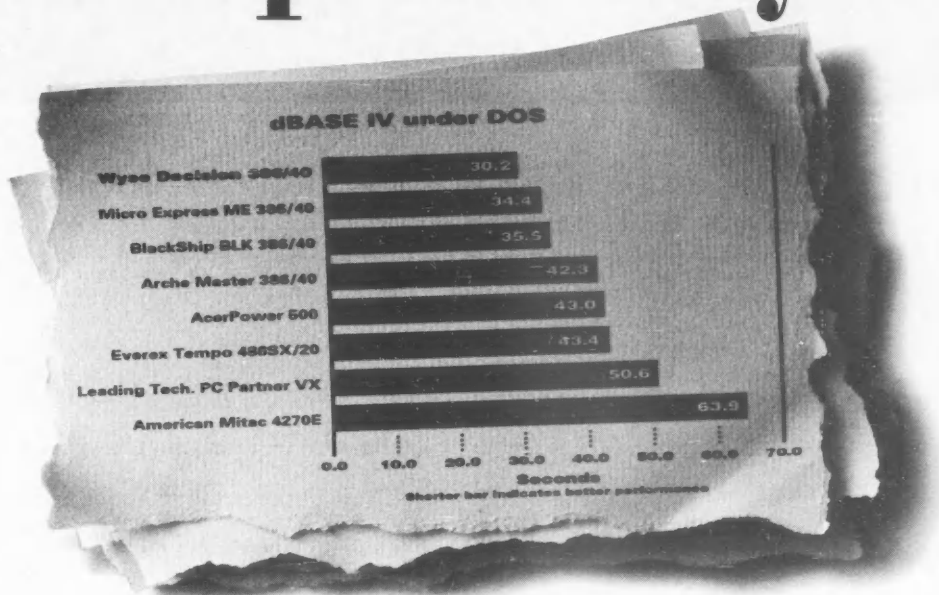
says he considers the regulations a major obstacle to cutting government bureaucracy and spending.

New security group created

► A new organization was recently formed to orchestrate efforts to create international standards computers and network architectures. The International Information Security Foundation's goal is to develop standards for computer and communications equipment vendors. Current projects include creation of a computer crime and virus database.



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IN DEPTH

Virtual reality's commercial reality

As an interface that lets users interact with computers through their senses, virtual reality holds promise for business and industry

BY HARVEY P. NEWQUIST

Until recently, the only practical applications of virtual reality were perceived to be in the entertainment industry — primarily in fancy video games. However, while the realm of fun and games has provided virtual reality technology with its most visible success to date, current research and development promises a bright future for the technology in business and industry.

Laboratory work on virtual reality is targeting troubleshooting, product design and data modeling as its key commercial applications. Virtual reality is vying to be the interface of the future, helping ordinary users interact with complex data through their senses.

Virtual reality (and its various synonyms, including telepresence, artificial worlds, multisensory I/O and even cyberspace) is a technology that enables users to enter computer-generated worlds and interface with them three-dimensionally through sight, sound and touch.

Through the use of interactive computer programs, users can treat system-generated objects as if they were real. Rather than look at a screen, users don special garb — a suit or glove with fiber-optic sensors that can interpret body positions as well as goggles that include video screens and audio attachments (see story page 94). In this way, they are immersed in a 3-D simulation or a model of reality.

The interaction with this alternate reality is accomplished by the use of two-way data transfer: Fiber-optic and electronic cables connected to the virtual reality equipment record the user's movement (looking around, gesturing, opening a "door") and send this information to workstations as motion data, which modifies the graphics in the model. For instance, if a user turns his head to the right, the computer generates a scene

that shifts images to the left.

This new information is sent back immediately to the user's headset, presenting him with a graphic and audio world that is in sync with his movements. This action/reaction information is updated continuously.

Unfortunately, most of the technology that will make virtual reality fly is still in its infancy, and getting involved with it today is a case of big bucks for limited functionality. A single-user system that includes a headset with goggles and headphones, a fiber-optic glove, a motion-sensing device and one workstation with 3-D modeling software typically starts at about \$50,000. Add more power and better equipment, and the cost can escalate to five times that amount.

But if you can wait about 10 years, costs for a system will become more reasonable, and most importantly, the research being done today will begin to bear fruit in the commercial world. Until then, it is imperative that you know what is coming so you won't be left behind.

Virtual reality meets IS

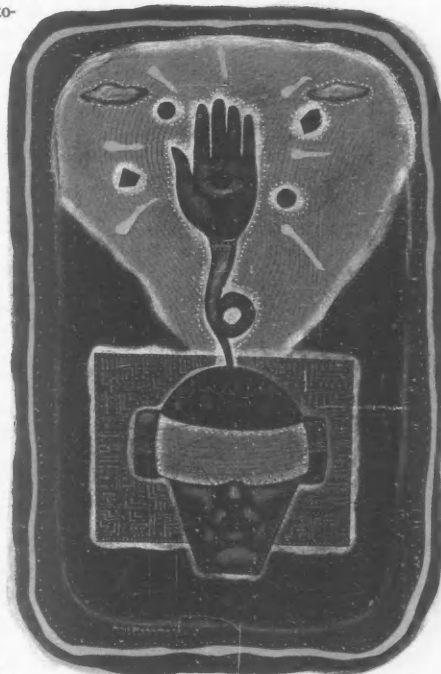
Virtual reality technology and its ability to let users observe data in a myriad of ways is being tested for traditional computing environments in the database and network areas.

As corporate data systems continue to grow, with an increasing need to discover and establish relationships between disparate data points, existing interfaces — such as windows, icons and menus — will fall far short of assisting the user in dealing with these endeavors. Currently, you see your databases via computer printouts or screen displays. This gives you very little sense of the relationships between fields, especially where many relationships and cross-references exist.

But in the last year, preliminary work at organizations such as VPL Research, Inc., the Human Interface Technology Laborato-

ry at the University of Washington and Digital Equipment Corp. is examining the "physical" interaction with the data world.

The thinking is that if users could interact with data the way they interact with other entities on a day-to-day basis, they could cut down on training, increase their ability to un-



Joel Nakamura

derstand data structures and simplify the operation of specific applications.

This research is concentrating on having the database administrator (or other user) "see" the database as a 3-D model, with physical bridges linking data through the use

Continued on page 94

Newquist writes and consults on artificial intelligence and other advanced technology topics at the Relayer Group in Scottsdale, Ariz.

• It'll cost 'ya — maybe as much as \$250,000

• Bloodless surgery

• A list of vendors and labs doing the research

Continued from page 93

of a virtual reality headset. In this way, he can get a look at the interconnections among data in the database.

Wearing a glove and headset, the administrator could then manipulate the data and its links without needing specific knowledge of a database application. For example, he could grab data about staff members who have certain experience that is critical for a specific job and group it in a section of the database.

Virtual reality researchers at VPL Research and Telepresence Research, Inc. are also exploring the technology's impact on data quality and integrity. By associating data and data streams with color, sound and movement (rotating or pulsating), virtual reality technology could alert the administrator to problems.

Pulsation, for example, could be programmed to signify aberrant behavior, not only in data but also in data structures. If on a quick check the administrator sees a file or memory sector pulsing like a strobe light, he'd know it was corrupted.

Network advantages

In the network area, the University of Tokyo is in the process of developing a prototype virtual reality system to help Tokyo Electric Power Co. monitor information flow over its massive computer networks. The researchers, whose work is expected to continue into the 21st century, are using eye goggles and gloves and are working with 3-D images of a computer-generated network grid.

Instead of trying to find weak links in the actual network of cables and programmed bits and bytes, they are exploring the possibility of alerting users to problems on the computer-generated network through color or sound. Upon hearing or seeing the problem area, instead of pouring over millions of lines of code, the user would correct it by pushing or pulling the appropriate components.

Pulling on a line in the network grid model would turn on a specific network

The following equipment is employed to create artificial, computer-generated worlds:

• **Eye phones and headpieces that govern the eyes.** Most virtual reality companies use sight control as the starting point for creating virtual worlds.

The primary item is a piece of headgear (which looks like either a piece of ophthalmic test equipment or a modified Star Wars helmet, depending on your frame of reference) attached by cable to a powerful workstation. These headpieces feature two small video screens, one for each eye, for a realistic, 3-D effect.

Frequently, there are motion or balance sensors within the headset that convey position coordinates (head turning left, head moving up) to the workstation, which then develops the appropriate scene displayed in front of the user's eyes.

For instance, if the user's head tilts down, as if he is looking at the floor, the computer would generate a scene that moves upward, giving the user the sensation of looking below the horizon.

Another variation of the head enclosure device is the use of a viewing screen mounted on a boom. The user peers into the semiclosed screen while guiding it up, down and around using two handles. The boom allows the screen to move in the direction the viewer wants it to.

• **Headphones and earphones that regulate sound.** To ensure that all sound experienced from within a virtual environment is generated by that environment, 3-D or holophonic

headphones are used to present the user with sound: music, sound from objects and noise that will alert the user to the location of an unseen object, such as behind or overhead.

• **Data gloves and touch sensors to provide synchronous movement of the hand in a simulated environment.** Using gloves outfitted with fiber-optic cables attached to a workstation, the user can place himself in the virtual world via a simulated hand that mimics all movement of the real hand encased inside the glove. Pointing a finger or closing a fist are translated into the same movements for the hand on the headset screen. In this way, a user can grasp virtual objects and move them around the computer-generated world.

One drawback to virtual reality technology in this area is that its tactile feedback ability is rudimentary; it isn't good at giving you clues about whether you have touched or grasped something or how much pressure and force you've applied. Oftentimes, aural clues (such as a "thunking" sound or a vacuum sound) are used in place of touch sensors to aid in the

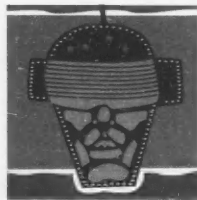
grasping of objects.

• **Movement.** Kinesiology, the study of the sense that tells you you're moving, is an area of great concern to virtual reality researchers. Most virtual reality systems rely exclusively on the use of visual impressions to relay the sense of movement.

Some researchers, however, are working on integrating components such as treadmills into the virtual reality system, allowing the user get a sense that he is strolling through the environment.

Dressed for success

Technology for eyes, ears and hands lets you enter a new world



Words & terms

Cybernetics: The study of human control functions and of the mechanical and electronic systems designed to replace or emulate them, including computers. "Cyber," as a prefix, denotes anything related to computer environments, especially things that involve extensive interaction by the user.

Cyberspace: Any shared reality based on computer connections. While virtual reality is a form of cyberspace, cyberspace is not virtual reality. (It's an "all men are mammals but not all mammals are men" kind of thing.) Telephone or bulletin board system conversations are a form of cyberspace, as is communicating on a network.

Cyberpunk: An avant-garde hacker.

Multisensory I/O: The use of more than one sensory mechanism (i.e., vision) to interact with a computer-generated environment. Used as a synonym for virtual reality.

Telepresence: The state of being "inside" a virtual world.

Virtual reality: The technology that combines computers and sensory mechanisms to create simulated, controlled environments and experiences.

Virtual world: A computer-generated environment that relies on sensory input via computer-controlled sensory mechanisms to create an interactive user/computer scenario. It is a component of virtual reality; using virtual reality, one "enters" a virtual world.

Since Air Force implementation in the 1960s, technology has flown to greater heights

Intense pursuit of virtual reality began in the late 1960s with a U.S. Air Force idea of immersing pilots into training simulators at Wright Patterson Air Force Base in Dayton, Ohio. In this way, pilots got the experience of being inside an aircraft in flight without actually having to leave the ground.

The benefits of this idea were numerous: Simulators would eliminate risk to both novice pilots and expensive aircraft; they could test a pilot in a specific situation at any given point in time; they could be used as often as necessary; and they could be controlled by technicians wishing to create specific flight scenarios.

Air Force researchers added head-mounted displays to existing motion simulators, and the environment was eventually enhanced through the use of motion sensors and holophonic, or 3-D, sound.

From the virtual cockpit, the tech-

nology — headsets, computers and, later, gloves — moved into NASA, which developed fuel-flow simulators for the space shuttle so that technicians could monitor fuel storage and use. NASA also began work on a virtual workstation.

With its Virtual Environment Workstation Project, NASA sought to combine information feeds from various sources (such as process monitoring, system support and even live video) into a single environment. The user would have control over various data worlds through the use of active windows presented within a headset, each of which could be touched and activated by a glove. This put all information relative to a specific operation (e.g., piloting the shuttle) in a single environment with a unified format.

Work on the virtual workstation project continues today, providing the roots for environments that may one day allow a user to control every operation and application in a computer system.

In their variation, they are trying to show data paths from source to satellite to network to individual user. The goal is to enable a technician to move through a 3-D map representing the thousands of miles worth of telecom links that reside underground, up in space, in the walls of a skyscraper or on the floor of a suburban lake.

Obviously, it would be physically impossible to track each line of a telecommunications system through each of these

Continued on page 95

Continued from page 94

environments, but moving through a computer simulation makes it possible.

Product design

The idea of working with a simulated environment is an attractive one in the product design area, where design and model building may be prohibited by space, time or expense. Companies are beginning to

ers would see on the headset screen and review basic analysis and design suggestions visually and tactilely.

The technology has not come far enough, however, for real-time changes to design plans. So, for instance, while designers could walk through a program and make changes to a model, those changes would have to be programmed into successive versions of the software and

them or break them apart to observe chemical bonding. In this way, scientists can develop new molecular entities by seeing and feeling whether different combinations of molecules will bond together.

Help for architects

In the highly design-intensive architectural business, in which changes to plans or architects' models means painstaking redrawing and model rebuilding, virtual reality may come into its own.

Acting on the assertion that it is easier to change a structure before it is built, organizations ranging from Hewlett-Packard Co. to the University of North Carolina to the city of Berlin, Germany, have commenced projects in which they've translated flat architectural drawings into 3-D computer-aided design software that can be changed and manipulated. Using gloves and headsets, clients and architects can walk through the building models, examining everything from hallway space to internal lighting. All changes to the architectural plans can be made before a single slab of concrete is laid.

HP is using equipment from VPL Research to design a new European office complex; the city of Berlin is using the same product to design a new subway that will link the East and West of the recently unified city; and the University of North Carolina used its own program to design the school's Sitterson Hall computer sciences building.

The technology's strength in the modeling area has also caught the eye of one of Matsushita Electric Works' department stores, which is putting virtual reality to work to pump up retail sales. Matsushita Electric has created a Virtual Kitchen application, which enables customers to mix and match appliances and furnishings from its store for their kitchens.

Users bring their kitchen layouts to the Matsushita store, and store personnel input a copy into the computer system. The prospective buyers then don headsets and goggles and go through a simulation of their kitchen, adding appliances and cabinets and changing colors and sizes until they put together a kitchen they like.

The beauty for customers is that they never have to install an item to know whether they like it. The benefit for Matsushita is that it can make on-the-spot sales.

As more money is pumped into devel-

Simulated surgery

The medical industry, for its part, is exploring the use of virtual reality in surgical simulation, which will help in training doctors as well as in diagnosing and treating patients.

Stanford Medical School, in conjunction with NASA, has created a software prototype for operating on simulated patients. The facility has developed virtual bodies, complete with physical calculations that provide accurate representations of body parts — limitations of muscles and tendons, movement of fluid-filled internal organs and so on.

Using virtual reality gloves and headsets, medical students and trained doctors can experiment with new procedures on simulated patients rather than real ones or cadavers. These simulated patients have an advantage over cadavers in that cadavers typically no longer have the resilience or the vital fluids necessary to mimic the effects of a real operation accurately.

Loma Linda Research Center in California, on the other hand, is using virtual reality as a diagnostic and treatment tool. The facility uses VPL Research's DataGlove to monitor the degree of change in the nervous tremblings of Parkinson's Disease patients. Fiber optics tracks the slight movement of patients' fingers and joints and sends the data to a computer to record the information.

Monitoring patients' tremblings to the millimeter enables doctors to get an accurate assessment of how patients respond to chemical treatment.

oping the technology, more commercial applications will be developed and deployed. By the turn of the century, virtual reality's use will have spread as costs come down and the technology reaches a level at which it is minimally invasive. •

Exciting concept, but . . .

Virtual reality is an infantile technology, so it has its share of drawbacks. Here are the major ones:

► **Cost.** The cost for getting into virtual reality is extreme. At the low end, a user needs a computer powerful enough to generate images and receive transmitted movement data. A powerful personal computer costs about \$5,000, with high-end Silicon Graphics, Inc. workstations priced at more than \$100,000.

A data glove will cost anywhere from \$6,000 to \$15,000, while a headset can cost from \$6,000 to \$50,000.

Software for developing virtual worlds runs from about \$1,500 to \$10,000.

Complete systems, which are offered by vendors such as VPL Research or W Industries Ltd. start at \$55,000 and can reach \$250,000 or more.

► **Invasiveness.** Existing technology components are somewhat cumbersome and invasive, given that sensors, computer feeds, motion detectors and video signals must be transmitted to the equipment. The user finds himself strapped into enough cabling to be concerned with freedom of movement, and most of this cabling is attached to a helmet, a glove and a heavy power pack.

► **Rudimentary graphics.** The graphical worlds and objects in a virtual environment are, for the most part, slow and even disorienting. (Case in point: After spending a day trying out different virtual reality worlds, I had a serious case of motion sickness.) Virtual reality worlds rely on basic 3-D shapes, as opposed to more photorealistic images or even live video.

explore the benefits of virtual reality in prototyping products.

Sun Microsystems, Inc. and The Boeing Co. have invested in the Human Interface Technology Lab in Seattle as well as in internal programs to delve into the possibility of remote design, with separately located engineers linked by computer network working on the same design in a 3-D space. Sun is examining high-resolution 3-D imaging to make interfaces more realistic, while Boeing is interested in cockpit design.

In reviewing a new carburetor design, for instance, a group of users networked into a common virtual reality system would be able to walk around a computer-generated engine without even being in the same country. Wearing goggles and gloves, each could make comments oth-

er would not occur instantaneously. In the future, changes would be incorporated into the design during the virtual reality session.

Virtual reality techniques could certainly help the product review process, with its paperwork shuffle and design drawing runaround.

Modeling is also key to pharmaceutical and biotechnology firms, which often deal with the microscopic world of molecules when putting together their products. The University of North Carolina at Chapel Hill is using virtual reality to assist pharmaceutical companies in modeling chemicals for use in their products.

The work consists of creating computer-generated molecular worlds in which researchers can physically grab onto molecular structures using gloves and bind

Who's who

Business, academia are making a place in artificial world

Here are the companies, computer vendors and academic institutions considered to be some of the key players in the virtual reality field:

- Crystal River Engineering, Inc. in Groveland, Calif. Creates state-of-the-art sound reproduction for virtual reality with its 3-D Convolutron, a headphone that accurately plays omnidirectionally recorded sounds and music. (209) 962-6382.
- Fake Space Labs in Menlo Park, Calif. Developed an alternative to the enclosed helmet video system with its Binocular Omni Orientation Monitor, known as BOOM. The user holds a video screen to his face and moves around a center-mounted boom stand that contains cables and wiring. (415) 688-1940.
- Telepresence Research, Inc. in Palo

Alto, Calif. Spun out of the work done by the virtual reality laboratory at NASA. The company does not develop its own hardware or software but acts as a virtual reality integrator for various clients, such as retail stores and oceanographers. (415) 325-8951.

- VPL Research, Inc. in Redwood City, Calif. A commercial pioneer of the technology concentrating on developing complete hardware systems (including headsets, gloves and Convolutron, as well as Silicon Graphics, Inc. and Apple Computer, Inc. Macintosh workstations), ranging from \$60,000 to \$250,000. (415) 306-1150.

- W Industries Ltd. in Leicester, England. Created the first mass-market virtual reality device: the Virtuality arcade equipment. Costs \$4 to play its Dactyl Nightmare game for 3½ minutes.

- Apple. Doing research using its Macintosh for virtual reality modeling and imaging. Interested in interface improvements.

- Digital Equipment Corp. Its Presence project is aimed at prototyping virtual worlds in software that doesn't have an arcade game feel.

- IBM. The Thomas J. Watson Laboratory has the Veridical User Interface project in the works. It is striving to take the other-worldly feel out of the interface and programs.

- MIT in Cambridge, Mass. Media Lab, Margaret Minsky, (617) 253-

0300; Human-Machine Systems Lab, Department of Mechanical Engineering, Thomas B. Sheridan, (617) 253-2201; Sensory Communications Group, Research Laboratory of Electronics, Nathaniel Durlach, (617) 253-2511.

Primary research: hardware and software development and tactile feedback. Minsky is concentrating on creating "virtual sandpaper," a tactile sensation felt in the glove representing grainy and rough surfaces.

- University of Washington in Seattle. Human Interface Technology Lab, Department of Industrial Engineering and Washington Technology Centers, Thomas Furness, director, (206) 543-5075.

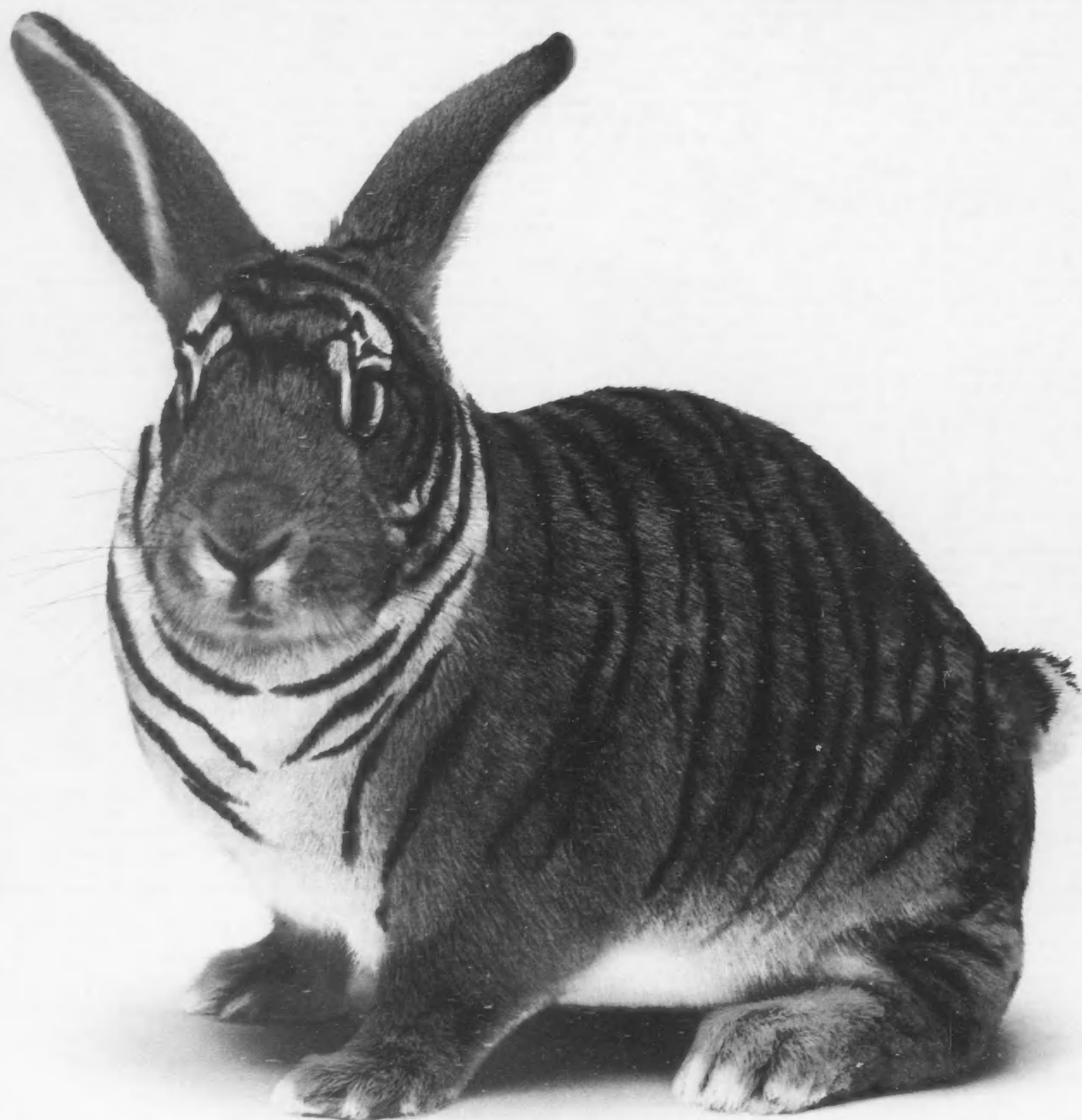
Primary research: Covers all aspects of software and hardware.

- University of North Carolina at Chapel Hill.

Computer science department, Fred Brooks, professor, (919) 962-1931.

Primary research: Software modeling for specific investors.





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MANAGER'S JOURNAL

EXECUTIVE TRACK



Tom Jones has been appointed data processing manager at Dickinson Direct

Mail, a privately owned direct-mail marketing company in Braintree, Mass.

Jones is responsible for Dickinson's programming, client data processing, mailing list processing and printing. He joined Dickinson 13 years ago and has held various positions in the data processing department.

Richard Brinkmann was elected a vice president at R. R. Donnelley & Sons Co., the Chicago-based global printing firm. Brinkmann, 46, continues as the company's manager of information systems.

Brinkmann has managed R. R. Donnelley's IS function since 1984. He joined the firm in 1978 as manager of MIS development and in 1981 became manager of MIS planning.

He holds a bachelor of science degree from the University of Illinois at Chicago.

Michael G. Eckstein, formerly president and chief operating officer of **Keystone Technologies**, was named president and chief executive officer of **EDI Able, Inc.**, a vendor of electronic data interchange (EDI) software and networking services in Malvern, Pa.

Eckstein spent 3½ years at Keystone Technologies, the wholly owned IS subsidiary of Pennsylvania Blue Shield.

Eckstein is a member of the ANSI Standards Committee for EDI insurance applications. He holds a bachelor of science degree and an MBA from Drexel University in Philadelphia.

Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Suite 400, 500 Airport Blvd., Burlingame, Calif. 94010.

Covering the world: Ted Turner's IS

'Just do it' mentality accommodates global events — on older equipment — at CNN

BY KIM S. NASH
CW STAFF

Even after Jay Leno permanently settles into Johnny Carson's chair in May, of Johnny may not be giving up the talk show ghost. The king of late night and his overchinned disciple may go head-to-head for the hearts of night owls, thanks to Ted Turner.

As the story goes, Turner seized — no, created — a chance to make a buck. Turner reportedly bought up all the old "Tonight Show" episodes through 1980, and rumor has it that he plans to run them directly opposite yuppie favorite Leno to lure older viewers away from NBC.

Atlanta-based Turner Broadcasting System, Inc. would be nowhere without that kind of gritty tooth-baring — and neither would the company's information systems department.

"We exploit our contacts where we can, but sometimes you get a real gut feeling about how to do a project and you just go," says Michael Johnson, MIS director for Turner Broadcasting's

more than 30 corporate partnerships, entertainment and news divisions.

Omnipresent Cable News Network (CNN) is probably the most visible of Johnson's challenges, mostly because there is no typical day there. "You're either setting up remote feeds from Saudi Arabia, trying to run phone lines from

was employed as an IS manager at The Coca-Cola Co. Coke's main office is just around the corner from CNN Center in downtown Atlanta, but the soft drink giant's rigid bureaucracy is a world away culturally, he says.

Turner Broadcasting may not exactly be a group of freewheelers, but the



Rob Nelson

Turner Broadcasting's Johnson says equipping CNN is his most visible challenge

Red Square or throwing together a local-area network to cover the latest earthquake in East Who-Knows-Where," he says.

Before coming to Turner Broadcasting in December 1987, Johnson

billion-dollar company has "the just do it attitude," Johnson says in his native Virginia twang. "Work can be done faster because a lot of things are done on handshakes that you don't have to

Continued on page 98

IS patents may be on weak ground

BY MITCH BETTS
CW STAFF

In the 1980s, it was fashionable to obtain patents for strategic information systems in the financial services industry, such as the trend-setting patent for Merrill

Lynch & Co.'s computerized Cash Management Account (CMA).

In the 1990s, companies may find out whether those patents are worth the paper they are written on.

Stephen C. Glazier, an attorney at Reid & Priest in Washington, D.C., argued in a recent memorandum that many of the patents "may be invalid and defeatable if challenged in court."

The U.S. Patent Office has been issuing the patents, which provide a 17-year monopoly, for the computer sys-

tems that underlie new financial and insurance products. For example, patents have been awarded for an "automated investment system" at Citibank NA as well as for a system that manages car loans at the Royal Bank of Canada.



The problem is that the patents rely on the mere computerization of a bookkeeping system, which nowadays is an "obvious" thing to do, Glazier contended. Under the law, an "obvious" invention cannot be patented.

"This argument has yet to be made and ruled on in court. When it is, many of these patents may be weakened or invalidated," Glazier's memo said.

PaineWebber, Inc. did challenge Merrill Lynch's CMA patent, but the resulting ruling said only that the CMA patent may be held valid in a trial, Glazier

noted. A trial was never held because the dispute was settled out of court, with PaineWebber presumably paying royalties, he said.

No real safeguard

Until a court does firmly rule on this issue, Glazier concluded, the IS patents "should be taken for what they are: weak and relatively easy to get."

A company should nevertheless try to accumulate as many IS patents as possible, he advised. That will put the company "in a better defensive strategy to have 'chips' that it may trade for licenses from other patent holders."

If nothing else, knowledge of this "unusually attractive line of attack" may help a company that is accused of infringing on a competitor's IS patent to negotiate a lower royalty payment, Glazier said. "It is possible that a cheap royalty for an existing, potentially invalid patent may be cheaper and more practical than litigating to invalidate" the patent, he said.

Covering the world: Turner's IS

CONTINUED FROM PAGE 97

worry about coming back to bite you."

When the newsroom needed new computer systems, for example, a couple of IS managers and key CNN staffers sat around a table one afternoon and hashed it out. As Johnson tells it, as of 1990, the volume of information sailing through CNN studios was so great that the old minicomputers from Parallel Computers, Inc. could not keep up.

"We told them, 'You need DEC 6310 VAXs, and here's what it'll cost the department.' The job was done within 30 days," he says.

Turner Broadcasting's 100-member IS staff, split into eight groups, handles everything from supporting secretarial word processing in Atlanta to connecting transponders for satellite communications to following on-air reporters around the world.

Flyaway fixtures

Despite the prime-time glamour, Johnson stresses that he has to solve the same technical headaches other firms do, the most painful of which is global telecommunications. "Being a media organization, we want to cover events live, but telecom is part of every company that wants to be a global force," he says.

CNN airs in 93 countries, and most have "less than state-of-the-art" communications, says

Fred Gamble, Turner Broadcasting's manager of telecommunications. No matter. Gamble's department put together "flyaway phone systems" — portable satellite uplinks that can provide a live signal from formerly inaccessible places within hours. "All we have to do is get a dial tone to it, and we're ready to send data or voice back home," Gamble says.

Flyaways weren't necessary for 1992 Winter Olympics coverage. Tricia Brownfield, PC systems support analyst, hopped a plane to Albertville, France, and whipped up a Novell, Inc. NetWare network.

Four weeks before opening ceremonies on Feb. 8, Brownfield had tied together about a dozen rented PCs and several Toshiba America Information Systems, Inc. laptops brought from Atlanta. Two weeks later, she flew back to Turner Broadcasting to link eight more in-studio PCs to the LAN in Albertville. She then connected all these PC nodes to an IBM OS/2-based touchscreen information system erected by the French Olympic Organizing Committee via a T1 line.

"I basically made sure our sportscasters had what they needed for every show," Brownfield says.

The PC group has recently started talks with IBM about plans to copy the Olympic touchscreen system for use at the Goodwill Games, sponsored by Ted Turner, in 1994.

Despite Turner Broadcasting's "break new ground" IS spirit, Johnson's crew does not use cutting-edge technology. In fact, a lot of the company's equipment consists of hand-me-downs from companies or parts of companies that Turner Broadcasting has bought during its 20 years in business. For instance, Turner Broadcasting had no mainframe at all until it acquired a 5-year-old IBM 3081 along with MGM/UA Entertainment Co. in 1986.

Instead of buying a server this year to act as traffic cop for the company's 8 to 10 different electronic-mail systems, Turner Broadcasting is likely to pick up an older,

cheaper IBM 3081 mainframe, according to Johnson. "We don't mind staying a step or two behind because the cost savings are there," he says.

Despite old equipment, the department performs technological feats other companies shy away from. For example, Johnson says the IS department makes a guarantee to any and all

mind looking out for reports of downed equipment from affiliates or other remote sites that contract with Turner Broadcasting. Gamble's telecom team is active in this extra function.

Like his counterparts in other industries, Johnson has had to decide whether and what to downsize. Although PCs and workstations may be more cost-efficient for some tasks compared with mainframes and minicomputers, Turner Broadcasting isn't making any wholesale moves to smaller box-

Election coverage

CNN has only one presidential election under its belt, but that is not stopping its ambitious coverage plans — with IS playing a key role.

CNN has basically tweaked its 1988 election year setup and added more sophisticated exit polling stations across the U.S., says Michael Johnson, MIS director at Turner Broadcasting. When all was said and done and George Bush was encoined in the White House, CNN had devoted 600 hours of airtime to the 1988 vote.

That kind of reporting is expensive, so this year CNN plans to do a lot of pool coverage through the Voter Research Survey, a New York-based network of wire services. The group's IBM mainframe will feed data from local polling sites to CNN's IBM 3081 in Atlanta.

Because the CNN newsroom is run on two "nearly fault-tolerant" Digital Equipment Corp. 6310 VAXs, Johnson hired a programmer he knows from his previous position a few blocks away at Coca-Cola to adapt the IBM-styled data for VAX terminals. CNN's newsroom uses sophisticated graphics software on the VAXs so that all of the information coming into the studio — and going out over the airwaves — is formatted in the same CNN style.

"My job is not to disrupt user comfort," Johnson says. "If we have two disparate pieces of equipment, we make 'em sing."

KIM S. NASH

Turner's lineup of computers

The hodgepodge of computers that take care of business at Turner Broadcasting System includes the following:

- One IBM 3081 mainframe for handling MGM/UA-related data processing.
- Two IBM Application System/400s.
- Two DEC 6310 VAXs for the CNN newsroom.
- Four DEC MicroVAXes for satellite scrambling system.
- One Prime Computer, Inc. 50 Series minicomputer for the CNN videotape library.
- One Hewlett-Packard Co. 3000 for satellite booking and tracking.
- Two low-end Data General Corp. MV models for retail sales related to properties acquired from Hanna-Barbera Productions, Inc.
- Several AT&T System 85, 75 telephone switches.
- Three thousand Apple Macintoshes, IBM PCs and clones, connected with 48 to 50 Novell NetWare and AppleTalk LANs.
- Eighty Toshiba Corp. laptops for CNN reporters; now piloting Apple PowerBook laptops.

end users: "You need to talk to another department, another company even, and we'll get you there — without putting another box on your desk."

Johnson's biggest project right now is directing the development of the firm's Television Accounting System (TVAC). TVAC is a database for tracking the Turner Network Television cable channel's extensive movie library, which includes *Gone with the Wind*, the original *King Kong* and all pre-1950 Warner Brothers, Inc. films.

TVAC will help manage movie contracts with local TV stations, covering items such as scheduling and payment for films aired. Johnson's application development group is charged with shifting pertinent data housed in off-the-shelf packages to a custom-made database based on IDMS from Computer Associates International, Inc. TVAC should be functional by the end of the year, Johnson says.

Beyond the call of duty

Reflecting Turner's own entrepreneurialism, Johnson's staff takes on duties not officially under its rubric. For example, because the data center is staffed 24 hours a day, workers don't

es. "The mainframe is still the best machine for high-volume, high-user activity," such as hosting Turner Broadcasting's databases, several of which handle more than 300,000 queries per month, Johnson says.

But the company also reportedly runs one of the largest Apple Computer, Inc. QuickMail networks in the U.S., which consist of 1,500 Apple Macintoshes of different sizes. About the same number of IBM PCs and clones connected via two dozen NetWare networks also hum through various, mostly administrative, departments.

The idea of outsourcing has been evaluated and subsequently nixed. As part of a project to assess how efficient its data center is, Turner Broadcasting gathered proposals from major out-sourcers. However, the lowest bid turned out to be about \$1 million higher than what Turner Broadcasting was already paying in staff, equipment and maintenance fees, Johnson says.

"We don't have a lot of money to spend, so we've always had to be efficient," he says. "The money this company makes goes to expand the broadcast side. . . . They're the real stars. We just support them."

CALENDAR

The Association for Systems Management's (ASM) 45th Information Systems Conference will be held May 3-6 at the Queen Elizabeth Hotel in Montreal.

Keynote speakers include leading consultants Vaughan Merlyn of Ernst & Young, Michael Treacy of Treacy & Co. and Jeff Tash of Database Decisions. A one-day Executive Issues Forum on May 4 features Pacific Bell Executive Vice President Jack Hancock, DMR Group Chairman Pierre Ducros and Bachman Information Systems, Inc. Chairman Charles W. Bachman.

For more information or to register, contact ASM in Cleveland at (216) 243-6900.

APRIL 19-25

Network Analysis Users Group Conference (NAUG). Monterey, Calif., April 20-24 — Contact: Sandy Moretto, NAUG headquarters, Menlo Park, Calif. (415) 688-2836.

Netcom West '92. Anaheim, Calif., April 21-23 — Contact: Jim Kloiber, Information Development Corp., Silver Spring, Md. (301) 565-4233.

Supercomputing Japan '92. Yokohama, Japan, April 22-24 — Contact: Meridian Pacific Group, Inc., Mill Valley, Calif. (415) 381-2255.

Synon '92. Atlanta, April 22-25 — Contact: Synon '92, Larkspur, Calif. (415) 461-5000.

Data Processing Management Association Regional Conference (DPMA). Columbus, Ohio, April 23-25 — Contact: DPMA, Columbus, Ohio (614) 792-3090.

APRIL 26 - MAY 2

Computer Audit, Control and Security Conference. Philadelphia, April 26-May 1 — Contact: EDP Auditors Association/Foundation, Inc., Carol Stream, Ill. (708) 682-1200.

Software Maintenance and Re-engineering. Chicago, April 27-29 — Contact: Applied Computer Research, Phoenix, Ariz. (602) 995-5929.

XWorld. New York, April 27-30 — Contact: Jennifer Fischer, SIGS Publications Group, New York, N.Y. (212) 274-0640.

Downsizing/Rightizing Corporate Computing Conference and Exposition. Los Angeles, April 27-May 1 — Contact: Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-4200.

USE, Inc. Conference. San Francisco, April 27-May 1 — Contact: Carolyn Abell, USE, Inc., Bladenburg, Md. (301) 699-9336.

James Martin World Seminar. Washington, D.C., April 27-May 1 — Contact: Susan Levine, Extended Intelligence, Chicago, Ill. (312) 346-7090.

DECWorld '92. Boston, April 27-May 15 — Contact: Royal America, Newton, Mass. (617) 244-2800.

Directions and Implications of Advanced Computing Symposium. Berkeley, Calif., May 2-3 — Contact: Doug Schuler, Seattle, Wash. (206) 865-3832.

MAY 3-9

Information Technology Association of America (ITAA) 76th Management Conference. New Orleans, May 3-6 — Contact: ITAA, Arlington, Va. (703) 284-5333.

COMMENTARY

Thornton May

Luddism looms large



In a kinder and gentler era, the efficacious nature of information technology went pretty much unquestioned. Technology was good for you. To paraphrase President John F. Kennedy's inaugural address, organizations seemed willing to pay any price, bear any burden and meet any hardship associated with staying on the technological leading edge.

In the current environment, the efficacious nature of information systems is no longer taken for granted. What is wanted now is a sharp pencil. "Show Me What I Paid For" benefit analysis. The debate around the transparency of IS' delivered value has created a political environment more conducive to retrenchment than expansion.

Score one for the modern-day Luddites — spiritual followers of Ned Ludd, the late 18th-

century British antitechnology leader.

What is precipitating the transformation of visionary leaders in the IS community into quishlings compelled to emasculate existing competencies in the name of cost reduction? From whence flows the lemming-like rush to the cliff of a new no-tech Dark Age?

In the current environment, IS practitioners are more frequently postured as villains and scapegoats than heroes. One need only look at the massive knowledge worker layoffs being contemplated in the aerospace industry in Los Angeles to understand that IS has fallen from grace.

The message to the non-brave is clear: "Hunker down. Be a Luddite. Don't buy new things, don't think new thoughts, stay low and hope the consultant with the ax will swing too high." IS looks pretty chubby to ax-swinging consultants these days. Score two for the Luddites.

Another factor contributing to the slide toward Luddism is a lack of leadership. Where are technologists to look for role models?

Consultants have done little to exert intellectual leadership in a world where old rules are no longer relevant. The frenzy of activity around navel-gazing,

inside-the-box, me-too versions of re-engineering has left managers not transformed but angry — and knowledge workers not empowered but unemployed.

The systems integrators are just as confused as you are. Their sales pitch reflects an industry-wide attempt at repositioning the IS function as a New Age version of strategic planning. Don't be fooled. While couched in the buzzword du jour (e.g., quality, empowerment, core competency, shareholder value), the underlying skill sets are those of bit-twiddling mechanics, not "blue chip" strategy consultants.

The academic community is also at fault. The Industrial Age models don't work anymore. The focus on case histories has not offered a prescriptive model to give managers the levers of control they need to drive in these dynamic times.

Corporations looking for intellectual leadership (most are just looking for cover) are hard-pressed to know where to turn. In the absence of a meaningful framework, the natural response is to revert to more primitive behavior. Cut costs, ax heads, manage that denominator. Score three for the Luddites.

In a world characterized by the declining relevance of existing rules, the ability to move outside your own corporate

boundaries and take a bigger look at the external value system is increasingly vital. Yet the behavioral profile of most IS practitioners is surprisingly sympathetic to staying within the box. Remember, these are the people who actually read technical manuals. Talk about rule-based!

The Mayans believed that everyone had two souls, one animal-like and one more human. George Bush had two faces during the 1988 campaign: George the Gentle and George the Ripper. IS departments should develop a similar form of ambidexterity wherein routine, inside-the-box needs are met by suburban behavior types, and exception processing needs are satisfied by adventurous frontiersmen.

Will a mantle of darkness settle over the once-booming information technology profession? It's up to us. We have the opportunity to mold our own destinies.

The chorus of "I'm not worthy" being played out in IS shops around the world is not helping. A twisted variant sees the senior IS person wrest the ax from the consultant declaring "let me help," as he lops the heads off his most trusted lieutenants.

What is needed is a perceptual repositioning from IS' currently untenable role as road

kill waiting to happen. We have a public relations problem. To promote a basketball team, a San Francisco-based advertising agency once ran ads showing people throwing paper into wastebaskets and laundry into hampers to show that the hoops game is part of everybody's life. A similar repositioning is needed for IS.

Take comfort in the fact that IS has the capacity to deliver real value. The challenge of survival for organizations in the postindustrial information age lies in large part upon the organization's ability to improve customer service and at the same time make money.

Historically, while most technology installations have succeeded in improving customer service, they have not enhanced the installing organizations' ability to make money. The all-important value capture portion of the exercise has been forgotten.

But some breakaway organizations are showing the way. New organizational models enabled by new technology platforms are being put in place as we speak. There will indeed be some legionnaires who will survive to turn back the snarling hordes of Luddites.

May is a principal at Praxis Consulting in Burlington, Mass.

Advice for the '90s: How to lay off workers

BY DAVID A. KELLY
SPECIAL TO CW

Laying off a fellow employee may not be the job you applied for, but it might be the one you are facing as an information systems manager in the 1990s.

Just ask Brian Scott, president of Banks of Iowa Computer Services, Inc. in Cedar Rapids, Iowa. Scott was responsible for the reorganization of the data processing company that services 53 banks in the Midwest.

"Layoffs are very traumatic on both the managers and the people being let go," Scott said. "Even though it is hard, people have to realize that downsizing is one of management's jobs. We needed to downsize because the data processing business was moving so fast that many of the job positions had become obsolete."

Bad news up front

Scott said he had to lay off about 10 data processing employees who could not fit into new job positions. One of his first decisions — one that personnel experts agree with — was to issue the bad news early in the week.

"We wanted them to start thinking about their skills and options right away," he said. "We suggested things such as

buying an answering machine and making contacts that could help them with the process."

Those on the unfortunate receiving end agree with this strategy. "It would have been a tremendous problem if I was laid off on Friday," said Tom Anderson, a former vice president at a bank-related data processing service bureau. "Instead, I was able to hit the road immediately Tuesday morning. I accepted the change and immediately started to work on finding a new job."

Layoffs affect not only the employees being let go but the remaining employees as well. Poorly handled layoffs can provoke bad feelings among remaining workers and from outsiders, such as customers and financial analysts. How a company treats laid-off workers has a great effect on how well remaining workers perform in the future.

"I watched morale really suffer after a reorganization," said Mike Ward, a former IS executive at a Midwestern data processing company. "People were faced with a smaller work force for a larger amount of work. It was a difficult process to go

through," he adds.

A manager should visit the various work units after people have been laid off to discuss what has been done and why it was done as well as to provide a summary of benefits that are being provided to laid-off workers, said Richard Deems, an outplacement consultant at Deems Associates, Inc. in Ankeny, Iowa, and author of *How to Fire Your Friends*. Letting the remaining employees know that management is open about the layoffs and cares enough to talk about them can help the remaining employees feel better.

Being open also helps to defuse negative reactions from remaining employees, who generally have three feelings about layoffs: anger (that the layoffs occurred); fear (that they may be next); and guilt (because they have a job and some of their friends do not). If the manager shows that the company is compassionate, he helps keep morale as high as possible.

When Scott's company was going through the reorganization, he found that treating the remaining employees as part-

ners helped to pull everyone together. "We shared the whole situation with them, letting them know the key problems that we senior managers were facing," he said. "This allowed the employees to understand what their role was and how it affected the company."

Employers — particularly those in small company towns — should also consider what is happening in the community and schedule layoffs accordingly. Deems pointed to a Fortune 500 company that announced major layoffs on a Friday, the same day that the local high school football team was playing for a championship. The community was in such a state of shock because of the layoffs that the game was a divisive event. Had the company made the announcement on the Tuesday before the game, Deems said, the football game could have helped draw the community together.

Some managers wonder how long laid-off employees should be allowed to stay on. The consensus among experts is to have workers leave the day they are laid off or the day after, with some type of severance or extra pay. This permits the laid-off employees to start a job search immediately, and it allows remaining employees to begin to

put the reorganization in place.

Once a manager calls an employee into his office for dismissal, he should be brief. The discussion should not take more than 7 to 10 minutes because there is little one can say to soften the blow, said Emily Koltzow, co-author of *Congratulations! You've Been Fired*.

"Handle it like taking off a Band-Aid: Pull it off quick," Koltzow said. "You're not being inhumane if you do it quickly because people just don't listen very well after. As soon as you say it, all the employee is thinking about his mortgage or car payments."

Give it a touch of class

How the company handles a layoff can have a big impact on how quickly the employee deals with the layoff and is able to begin looking for another job.

"If a company executes a layoff with some degree of class and treats its workers well, the laid-off employees can get on with their lives and start a job search right away," Deems said.

"The first round of IS people we laid off all found jobs at a higher pay rate and have ended up being real happy," Scott said. "It still amazes me, but every single one is making more money than when they worked for me. It hurts my feelings a little."

Kelly is a free-lance writer based in Waltham, Mass.



COMPUTER CAREERS

Finesse often finishes first

There's nothing wrong with a little self-promotion, as long as it's subtle

BY LESLIE GOFF
SPECIAL TO CW

The difference between gaining respect and gaining a reputation as a blowhard may be in how you promote yourself. Information systems workers looking to get ahead oftentimes must seek a delicate balance between self-promotion and team play.

"Invariably, people who speak up a lot seem to be very crass people, and colleagues don't take well to it," says Bob Surabian, a project leader at H. W. Wilson Co., a publisher of reference books and library materials in New York City. "These people aren't the ones that you want to sit down after work and have a beer with. They're just blowhards."

A job well done is almost bound to get noticed sooner or later, but if you'd like to make sure it's sooner, both IS pros and managers suggest dropping subtle hints to managers and getting involved in high-profile projects. Neither of these tactics is likely to make you a pariah among your peers.

For Dave Wells, systems manager at Dana Corp. in Reading,

Pa., a manufacturer of truck frames, attention to detail on a key project and the fact that his boss found out he was getting his master's degree were key to his promotion from programmer/analyst in February.

Wells let his work on the project speak for itself. As for letting his boss know he was going to school at night, he subtly flagged that fact by asking him to sign his tuition reimbursement form.

Surabian finds that a more direct approach helps the boss see he's doing more than just getting the job done.

"I'll go in on weekends, and I always make sure my boss knows about it. I just say, 'Hey, Jerry, there was a little problem with such and such this weekend, and they called me at 2:00 Saturday morning and I came in.' He's a pretty much hands-on person and wants to know about stuff like that. A lot of it has to do with the nature of management in the department," Surabian says.

Getting exposure

In formally structured IS groups, you can make a name for yourself by taking advantage of opportunities to write memos, submit white papers or put your ideas through the budgeting process.

The telecommunications unit at Kansas City Power & Light Co. in Kansas City, Mo., for example, writes papers for senior management and users to test company interest in particular technologies and to determine if a technology would prove to be cost-beneficial in certain departments.

Through this method of communication, "We try to make ourselves as indispensable to the company as possible," says Carl Greenway, director of telecommunications.

"Asking a lot of questions about the business — not the data processing — and getting to know the users in the various departments" is what got Greg Knowles promoted from temporary consultant to programming manager at American Fabric Co., a maker of lace and embroideries in Bridgeport, Conn.

Hired to help program new order processing and inventory control systems, Knowles quickly gained management's attention because, he says, he "was able to make suggestions and re-

finements from the point of view of value to the company, rather than simply doing as I was told as a consultant." He spent time in the company's order processing department and observed how individuals worked — how they handled customers' questions regarding the status of orders, returns and the like.

Knowles then developed new ways of accessing order information — by ship date, customer name, address and other angles, instead of only by order number.

How well you are able to move up through your firm without jeopardizing relationships with fellow staff members depends largely on how well you establish a rapport with bosses and communicate

with nontechnical employees as well as fellow technicians. Styles also vary within different IS structures and corporate cultures.

At H. W. Wilson, for instance, the IS infrastructure is informal, and the organizational chart is flat. Surabian found that lack of errors speaks as loudly as lots of errors. By keeping things running without disruption, he has been promoted several times in his six years at the company. "Management noticed my work because things were running

smoothly," he says.

Individual unit IS managers at Schering Plough Corp.'s decentralized business units commission their own departmental applications from IS, giving staff members a lot of opportunity for involvement with users, says Dave Ellison, director of headquarters business systems at the Madison, N.J.-based pharmaceuticals firm.

User recognition

The chance to work closely with users is not available in all IS positions, however, and good communication skills are essential to making these opportunities work.

"Given how the department heads feel about the importance of their projects, all projects here would be regarded as high visibility," Ellison says.

"If you exercise those opportunities to deliver projects as expected and build a level of satisfaction in the user community, you develop a reputation as a provider."

If users and user department managers are more pleased with the quality of your work, you can assume they'll discuss their satisfaction with your management, Ellison says. "That's a little different than going out and saying, 'Hey, look what a good job I did.'"

Goff is a New York-based free-lance writer.



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Network managers: Beyond fire fighting

BY EMILY LEINFUSS
SPECIAL TO CW

It's like being a fire fighter or even a kindergarten teacher. That's how network managers describe their jobs.

Take, for instance, Keith Fletcher, network administrator at Morris Plains, N.J.-based pharmaceutical firm Warner-Lambert Co., who spent an entire afternoon trying to locate the source of a network outage.

After much technical searching, Fletcher found the problem — someone had used the big red switch instead of the surge protector to turn off a computer.

"Users don't want to know how a computer works, only that it works. So if one key is stuck because the user was eating sticky stuff over the keyboard, they don't report the key is stuck, only that the computer doesn't work," Fletcher says.

To the rescue

Local-area network managers get satisfaction from putting out fires, says Ed Ackerman, LAN manager at Consolidated International Insurance Group, Inc. in Wilmington, Del. Most say they like the problem-solving element of the job.

Ackerman says that when one user had a problem running a specific application, the quick fix would have been to tell the user not to run the application from that machine. But compelled to look for a more complete answer, he found the problem in the hardware on that user's personal computer, he says, and got a

great deal of satisfaction from discovering the root of the problem.

"People are depending on the network. It can't ever be down," says Emil Stephenson, network supervisor at Stone & Webster Engineering in Boston. "We used to have a window to do maintenance on Saturday and Sunday. Now the window is 2 a.m. to 5 a.m. on Sunday." This increases the stress on the staff members who try to keep up, according to Stephenson.

This trend toward network dependency is changing the role of the network manager, says Jim Finch, a senior network systems engineer at The Shareholder Services Group, a business unit of First Data Corp. in Boston. The biggest change, Finch says, is that network managers are starting to get involved with corporate strategic direction and planning.

This has opened the door to new types of network managers. One type is the enterprise network manager, who possesses big-picture managerial skills.

Another is the specialist, who has developed very high skill levels in a particular type of network technology or a particular network discipline.

In addition, network managers need to have at least a basic knowledge of the technology, says Richard Van Slyke, director emeritus of The Center for Advanced Technology in Telecom-

munications.

However, enterprise network planners have to attain a broad, managerial orientation, Van Slyke says.

"While there is no substitute for on-the-job training, network managers will be more effective if they have a global view," Van Slyke says. His organization "tries to give a comprehensive view of products and emerging technologies, but we also provide a look at the whole universe of network management, so you know what is possible and what is appropriate for your company."

In addition to the new professional stature of the enterprise network manager, there is also a shift toward more specialized network managers.

"As you come into the enterprise level, you start to specialize, and there are several career paths in this area," says Ron Scott, a section head telecommunications operations at Toronto-based Ontario Hydro and chairman of the Network Management Forum's user advisory council.

These career avenues include systems-level systems management, voice network management, data network management and telecommunications facility management as well as maintenance positions such as fault management and performance management, Scott says.

"The title 'network manager' has a lot of different meanings.

My advice would be to focus on what part of network management you want to break into and then pick up the appropriate skills," Scott says.

Advice on breaking into the field of network management or furthering your career depends on keeping up with the ever-changing technology: It is best to keep as informed as possible on what area you want to move into and where the technology in that area is headed.

Knowing the ropes

Each category of network management tasks requires different skill sets. For example, a hardware maintenance technician must know about the technology, while someone without much computer knowledge but a strong background in mathematics and statistical analysis would be able to assess and plan for traffic management.

"Once you get to planning levels, any academic discipline that teaches analytic techniques — engineering, computer science or math — is a good background," Scott explains. "You can't be an expert in everything, but a network manager has to have a good understanding of all the variables."

For example, if your organization is an IBM shop, certain network management systems work better with IBM systems, and others are suited for multivendor platforms, he says.

Van Slyke points to the trend toward integrated network man-

agement technology — computer systems that can integrate the management of several systems, including wide-area networks, LANs, telephony and data.

Most network managers agree that the most exciting and most difficult part of their job is

WHILE THERE IS no substitute for on-the-job training, network managers will be more effective if they have a global view."

RICHARD VAN SLYKE
CENTER FOR ADVANCED
TECHNOLOGY

keeping up with the technology. "The sheer volume of information that you need to assimilate on a regular basis is overwhelming," Finch says.

Stephenson says the technology changes quickly: There is something new to learn every day.

However, the pressure to stay current "can wear you down," Stephenson adds.

As network management continues to change, there will be less demand for people who can troubleshoot network problems because the networks will be more fully automated.

"If and when we get to the point where managing a LAN is trivial, the skill required to do it won't be great," Scott says. Regarding job demand, he says, "The answer today may not be the answer tomorrow."

Leinfuss is a free-lance writer based in Sarasota, Fla.



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One position is located at our Headquarters in Jackson, Mississippi, and is responsible for developing the tactical and strategic plans for the nuclear plant organization.

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All positions require high level, IS specialists with above average technical skills and abilities.

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President
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Stephen J. Kukoy is not only President of National Computer Associates, but also President of Abacus Consultants, Inc. in Denver. Having been in the recruitment business for nearly 15 years, he knows the critical role advertising plays in finding the best qualified professionals. He also knows where his recruitment advertising dollars are best spent.

Founded in 1971, National Computer Associates (NCA) is an exclusive group of private firms dedicated to importing and exporting computer personnel on a national basis. With an active membership of 30 firms throughout the United States, Great Britain, Canada, and Australia, NCA is virtually a network of "branch offices" working together to place the best qualified IS professionals in the right jobs. Today, NCA's aggressive growth and strategic market positioning make recruitment advertising more important than ever.

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ICARDA, one of 16 international agricultural research centers supported by the Consultative Group on International Agricultural Research, has initiated recently on a major project to improve its computer center. As part of this project, it is acquiring a dual-host VAX 4000/500 computer system, installing an Ethernet network to link the VAX computers and personal computers, and acquiring a number of new software application packages. As a result, ICARDA is looking for a number of qualified computer professionals, as follows:

INFORMATION SYSTEMS TEAM LEADER

The Information Systems Team Leader will lead a group of Analysts/Programmers to customize packages or design and develop, and implement Management Information Systems. The candidate is expected to have a B.Sc. degree in Computer Science or Business Administration or Accounting, and be professionally trained in systems analysis and design, data base design and programming. He/She should have a minimum of ten years experience in data processing, including at least 2 years in a project management position, extensive experience in the design and implementation of management information systems, CASE Tools and a fourth-generation language. Experience in Oracle Financials and Oracle DBMS would be a distinct advantage.

SCIENTIFIC DATA BASE SENIOR ANALYST/PROGRAMMER

The Senior Analyst/Programmer will develop conceptual data models for required research data bases, carry out logical and physical designs of data bases and implements using the specified DBMS, and develop necessary data entry validation, enquiry, processing and reporting programs for the data bases, in coordination with the scientific users. The candidate will have a B.Sc. degree in Computer Science or a related scientific field, and be professionally trained in systems analysis and design, data base design and programming. He/She should have a minimum of eight years experience in data processing, including at least two years experience in the design of scientific data bases and systems, extensive experience in programming and experience in CASE tools and a fourth-generation language.

SYSTEMS PROGRAMMER/NETWORK ADMINISTRATOR

The main tasks will be the installation, customization and maintenance of VMS operating system, layered software products, networking software and other system software for the VAX computer systems. The SP/NA will ensure smooth operation, monitor the performance and tune the computer systems and network. Candidates will have a B.Sc. degree in Computer Science or a related quantitative field, and have professional training in systems programming. A minimum of six years experience in data processing, including at least two years in VMS operating system management and DECnet networking software support, is expected. Experience with DOS and PCs highly desirable.

PC SENIOR PROGRAMMER

The PC Senior Programmer will support ICARDA-wide users in the installation and use of standard PC packages designed by ICARDA, including resolution of problems and providing consultancy service; help users in preparing specifications of PCs and selection of software; carry out training in the use of personal computers and standard PC packages. The candidate is expected to have a B.Sc. degree in Computer Science or a related quantitative field and professional training in personal computer software. He/She will have a minimum of six years experience in data processing, including at least three years in personal computers environment and PC software packages support. Excellent experience with DOS, word processing, spreadsheeting, data base and graphics PC software is essential.

Benefits: Salary paid in US dollars based on experience and qualifications. Benefits include housing allowance, paid home leave travel, a retirement and health package, provided auto, free enrollment for dependents at the ICARDA-administered school (K-12), and other internationally competitive conditions of service.

Application: Qualified applicants are invited to send:

1) a curriculum vitae with recent salary history; 2) names, addresses, and tele numbers of three professional referees; 3) photocopies (non-returnable) of other relevant supporting documents, to:

**Dr. Aart van Schoonhoven, Deputy Director General (Research)
ICARDA, P.O. Box 5466, Aleppo, Syria**

Telex: 331208 ICARDA SY, 331263 ICARDA SY, or 331206 ICARDA SY

Telephone: (963-21) 213433, 213477, or 234890 Fax: (963-21) 213490 or 225105

REFERENCE: Please quote position no. DG/01/92/ in application. **APPLICATION DEADLINE:** Positions open until qualified candidates identified. ICARDA is an equal opportunity employer.

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DATABASE ANALYST & DESIGNER

(Position Code DAD-2) Minimum of 8 years experience in Database Analysis and design. The last four years must be in DB2. Must have extensive background in system analysis and design in a DBMS environment.

ENGINEERING ANALYST

(Position Code EA-3) Minimum of 8 years experience in any of the fields of transmission, generation, distribution, load forecasting and/or maintenance planning related computer information systems experience is required.

INFORMATION SYSTEM ANALYST

(Position Code ISA-4) Minimum of 10 years practical experience in information systems analysis and design; in commercial and/or technical applications. Experience in computerized mapping and graphics system is highly demanded.

DOCUMENTATION ANALYST

(Position Code DA-5) Minimum of 8 years experience in DP documentation i.e. drafting, editing, re-writing and compilation of reports and documents; secretarial and document quality control background is a significant advantage.

PROGRAMMER

(Position Code P-6) Minimum of 8 years experience in developing and maintaining application programs particularly on-line programs using COBOL/FORTRAN and/or 4th generation language with CICS. Experience in graphical mapping systems, and GDDM is highly demanded.

SYSTEM PROGRAMMER

(Position Code SP-7) Minimum of 5 years experience in the installation, maintenance & tuning of the following products: CICS, DB2, DFHSM, SMS, RACF, RMF, SMF, VTAM, NCP, NETVIEW.

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Those who are possessing all the requirements, conditions and interested are only invited to send updated resume including Phone No., full address, certified copy of all educational and work experiences within 30 days of this date to this address.

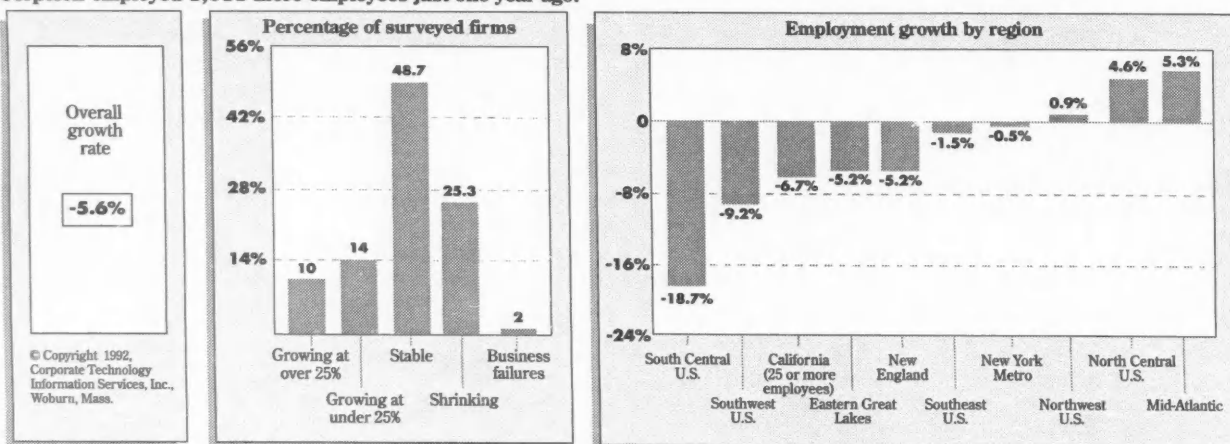
Saudi Consolidated Electric Company Central Region, P.O. Box - 57, Riyadh - 11411, Saudi Arabia, Attn: Mr. A. Aziz Al-Salamah, Senior Chief Employment, Telephone: 4032222/Ext. 1217, Fax No: 01-4055270

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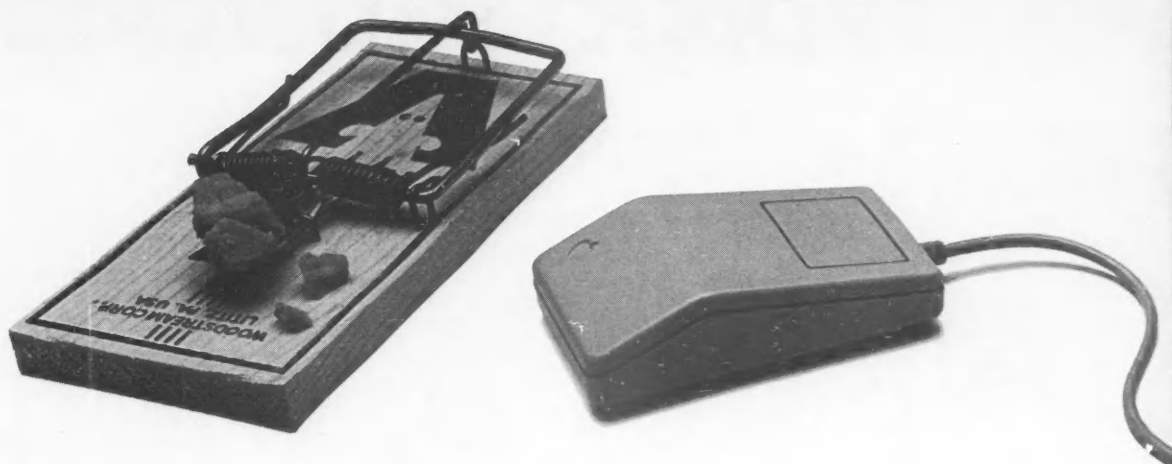
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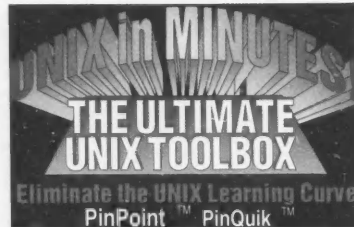
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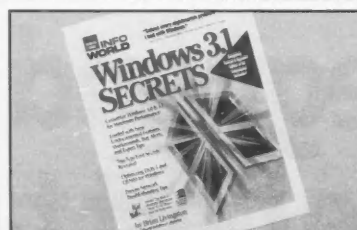


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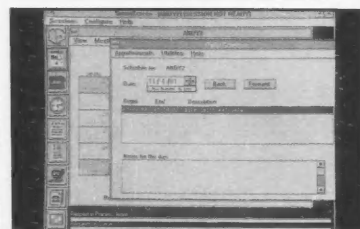
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MARKETPLACE

Facing VDT-related ills sooner is better

Legal eye is a column explaining legal issues and their impact on information systems.

BY JOEL B. GILMAN
SPECIAL TO CW

Even though no state has ever implemented a law that protects employees against VDT-related injuries, things are changing quickly: The rules that apply today may be different tomorrow.

Currently, the only recourse for employees suffering from eyestrain, headaches, nausea, carpal tunnel syndrome or any other variety of VDT-related injury is to take the hardware manufacturer, distributor or reseller to court rather than the employer. The logic is, if the manufacturer was negligent in designing equipment that would foreseeably cause injuries, the vendor should be held liable for not addressing the proper safety issues.

Many employees suffering from repetitive-stress injuries (RSI) have taken computer manufacturers to court, seeking compensation. None have won yet, but at least 18 suits involving more than 90 plaintiffs are pending. Defendants include hardware manufacturers, such as

IBM and Wang Laboratories, Inc., as well as systems integrators.

In product liability suits such as these, courts will sometimes apply a "strict liability" standard whereby the injured party need not prove the manufacturer was negligent but only that the product was patently dangerous and caused the injury. Strict liability is normally applied to products such as power tools or other articles that clearly pose hazards, but it could eventually apply to VDT-

related issues.

Some suits have even been filed against software manufacturers. Even though the software doesn't "cause" the injury, operators would not be subject to injuries had they not used the software. This is known as "proximate cause."

Employer's accountability

Employers are usually immune from workplace liability because of worker's compensation statutes, which exist in most states.

An exception to this immunity, however, is when the employer's conduct has recklessly endangered workers. This can involve failure to provide adequate training or safety equipment, where the risk of injury is obviously the result of a violation of an existing

safety regulation.

Failing to mitigate VDT risks may be simple negligence; hence, there is no liability to the employer. But as the evidence mounts, failure to mitigate will at some point be seen as reckless endangerment.

To keep up with possible changes in the current rules regarding VDTs, employers should take the following precautions to protect themselves as well as their employees:

• **Antiglare screens.** While these devices do not block CRT radiation, they do relieve eyestrain and its related problems,

such as dizziness, headaches, nausea, etc. These devices are inexpensive and attach easily to a monitor.

• Frequent breaks.

By requiring or encouraging data entry and other full-time computer operators to take a 10-minute break at least every two hours or preferably every hour, a worker minimizes the risk of a RSI. A better approach is to redesign the work process so that the operator has to leave the keyboard for several minutes every hour, breaking up the repetitive motion.

• **Ergonomic workstations.** Orthopedically correct chairs and workstations allow the employee to be comfortable, healthy and more productive. Retain an ergonomics consultant to evaluate not only chairs but also workstations for height, lighting and keyboard position.

• **CRT shielding.** The Swedish Board for Technical Accreditation established a standard for CRT emissions known as MPRII.

Although Apple Computer, Inc. and IBM have introduced MPRII-compliant monitors, most equipment currently on the market does not meet this standard, so research needs to be done in order to identify those that do.

Gilman is a Seattle-based attorney who practices computer law. Robert Dieterich, managing editor of "VDT News," contributed to this article.



Ergonomic laws in motion

Although no state has enacted comprehensive safety standards for VDT users, some local governments have made their own attempts to do so.

The first to establish safety standards was Suffolk County, N.Y., in 1988. It set requirements for VDT design, workstation and chair design and antiglare screens and mandated the length and frequency of operator breaks to reduce the hazard of RSI.

The law was invalidated in a lawsuit, however, largely on the grounds that in New York, as in most states, workplace regulations are the domain of the state legislature and the federal government, not the county government.

A new law in Maine requires employers with

five or more terminals to provide annual safety training to users, and those with two or more terminals must distribute safety literature.

The federal government, mainly the Occupational Safety and Health Administration (OSHA), will propose a set of regulations in the near future. In the meantime, resources available to inform you about health risks and safety measures for VDT use include the following:

• **Working Safely with Video Display Terminals and Ergonomics: The Study of Work**, both published by OSHA and available from the U.S. Government Printing Office.

• "VDT News," a bimonthly newsletter based in New York.

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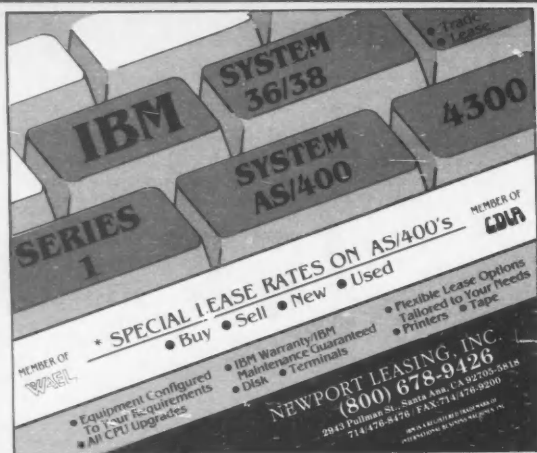
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Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg., Suite 508, Jackson, MS 39201 for the following:
RFP No. 2154, due Thurs. 4/23/92 at 3:30 p.m. for Local Area Network based educational instruction labs for the Columbus and Oakley Youth Services Facilities for the MISSISSIPPI DEPARTMENT OF HUMAN SERVICES.
RFP No. 2179, due Tues. 5/05/92 at 3:30 p.m. for the development and implementation of a J385 Automated Work System (JAWS) for the MISSISSIPPI DEPARTMENT OF HUMAN SERVICES. A mandatory bidder's conference will be held Monday, April 13, 1992 at 10:00 a.m. at the Department of Human Services, 3450 Highway 80 West, Jackson, Mississippi.
RFP No. 2180, due Wed. 4/29/92 at 3:30 p.m. for a new mainframe processor to replace an existing IBM 3090-400E mainframe running IBM's MVS/ESA operating system for the MISSISSIPPI DEPARTMENT OF HUMAN SERVICES.
RFP No. 2181, due Wed. 4/29/92 at 3:30 p.m. for 30 Gigabytes of IBM 3380/3390 compatible disk drives for the MISSISSIPPI DEPARTMENT OF HUMAN SERVICES.
RFP No. 2182, due Mon. 4/20/92 at 3:30 p.m. for a RISC-Based processor completely compatible with an existing ESRI ARC/INFO-based GIS running on a Tektronix workstation and capable of automatically supporting Office Automation Consultants' ACTS software currently running on a Wang VS450 SYSTEM for the MISSISSIPPI PUBLIC SERVICE COMMISSION.
Kell Brown at (601) 359-2604

City of Corpus Christi

Sealed proposals will be received by Purchasing Dept., City of Corpus Christi, P. O. Box 9227, Corpus Christi, TX 78469 for the following:
RFP No. BI-129-92, due Tue. 5/26/92, for the turn-key installation of a software system. The software system will include payroll, human resources, and a relational database management system.
RFP No. BI-130-92, due on Mon. 5/4/92, for the turn-key installation of either an IBM ES/9000 or 3090 mainframe computer. The computer replacement may require the selected vendor to make modifications to the present site and/or expand it into the adjacent storage area.
Contact: Dennis Bilbe (512) 880-3751

METROPOLITAN TRANSPORTATION AUTHORITY NOTICE is hereby given that the Metropolitan Transportation Authority (MTA) will receive Technical Information pertaining to computer mainframe equipment and related budgetary pricing options. The technical information received in response to this Request for Information (RFI) may be used to prepare a Request for Proposal or Information for Bid at a later date. A copy of the RFI may be secured from Ms. Angie Philter, Executive Secretary, Procurement Services, MTA, 347 Madison Avenue, New York, NY 10017.
RFI# DATE TIME
9-01-92048-0 04/09/92 3PM
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AT Model 099	\$400	\$525	\$150
AT Model 239	\$550	\$650	\$175
AT Model 339	\$700	\$1,000	\$250
PS/2 Model 30 286	\$650	\$900	\$300
PS/2 Model 60	\$700	\$900	\$325
PS/2 Model 80	\$2,050	\$2,100	\$1,100
PS/2 Model 90	\$4,300	\$4,600	\$3,300
Compaq Portable II	\$450	\$500	\$375
Portable 286	\$900	\$1,000	\$250
Portable 386	\$2,000	\$2,125	\$1,000
SLT 286	\$700	\$900	\$400
LTE 286	\$950	\$1,300	\$500
Deskpro 286E	\$600	\$1,000	\$325
Deskpro 386/20	\$2,000	\$2,200	\$1,100
Apple Macintosh Plus	\$700	\$750	\$475
SE	\$950	\$1,050	\$650
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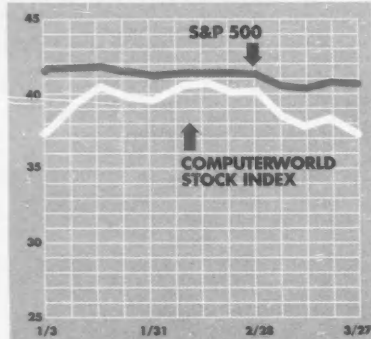
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Alpha Microsystems	10.53
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Commodore Int'l	1.38
Archive Corp.	1.13
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Seymour Systems Inc.	0.88
Sungard Data Systems	0.75

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NYS 55.00 22.63	Onet Communications Corp.	31.50 -2.75 -8.03
OTC 82.38 68.00	Pentel Data Comm. Nwks.	42.00 -3.75 -8.20
OTC 37.50 15.50	Pictet Corp.	13.75 -1.25 -8.33
OTC 11.63 5.63	Proton Inc.	12.25 -7.04 -56.64
OTC 53.00 19.75	Scientific Atlanta Inc.	58.00 -7.75 -12.80
OTC 18.75 9.75	Southwestern Bell Corp.	22.00 -1.50 -6.36
NYS 11.63 5.63	Synopsis Communications	21.88 0.00 0.00
NYS 66.00 49.00	US World Inc.	33.75 -0.13 -0.37
OTC 46.25 14.25	Wellnet Communications	34.00 -4.13 -10.82
NYS 35.50 21.00		
NYS 40.00 33.38		
OTC 41.25 21.25		

PC/Workstations

Off 3.20%

OTC 20.75 6.50	Advanced Logic Research	7.00 -0.50 -6.67
OTC 1.50 1.50	Alpha Microsystems	0.00 0.25 10.53
OTC 73.25 40.25	Architectural Systems	61.00 -2.25 -3.66
OTC 32.75 14.50	AST Research Inc.*	17.75 -1.25 -6.58
NYS 21.63 10.13	Commodore Int'l	1.56 1.38 9.51
NYS 67.00 22.13	Compaq Computer Corp.*	26.25 -2.38 -8.30
OTC 41.00 20.25	Dell Computer Corp. (H)	37.75 -3.00 -7.36
OTC 7.75 3.00	Everex Systems Inc.	0.19 -0.19 -27.72
NYS 34.00 21.25	Harris Corp.	31.00 -2.00 -6.06
NYS 80.00 44.63	Hewlett-Packard Co. (H)	79.88 -2.50 -3.03
OTC 25.88 7.88	Mips Computer Systems	12.38 -1.00 -7.74
OTC 29.75 13.25	Silicon Graphics	12.75 -1.50 -10.74
OTC 38.63 20.75	Sun Microsystems Inc.*	28.13 -2.25 -7.41
NYS 36.50 23.38	Tandy Corp.	29.88 0.00 0.00
NYS 11.13 5.13	Zenith Electronics	12.38 -0.13 -1.05
OTC 25.50 13.25	Zoex International Ltd. (L)	13.75 -0.25 -1.79

Large Systems

Off 6.80%

ASE 20.63 11.63	Amdahl Corp.*	16.75 -0.75 -4.29
OTC 2.63 0.69	Computer Automation Inc. (L)	0.69 -0.25 -26.65
NYS 13.38 7.50	Control Data Corp.	12.75 -0.75 -5.88
NYS 19.75 8.88	Convex Computer	11.38 -2.50 -18.02
OTC 19.63 4.13	Cray Computer	5.13 -0.38 -6.82
NYS 52.25 31.50	Cray Research Inc.*	41.25 -3.25 -7.30
NYS 22.50 9.88	Digital Equipment Corp. (L)	9.88 -0.75 -7.06
NYS 74.25 48.50	Digital Equipment Corp.*	54.50 -2.25 -3.96
NYS 114.75 83.25	IBM*	83.25 -2.88 -3.34
NYS 131.00 93.50	Matsushita Electronics	96.00 -4.00 -4.00
OTC 29.50 10.75	Pyramid Technology	14.75 -1.50 -9.23
OTC 18.50 7.50	Sequent Computer Sys.	14.38 0.25 1.77
OTC 18.38 10.13	Sequent Systems Inc.	14.88 0.88 6.25
NYS 54.25 27.25	Stratus Computer Inc.*	43.88 -6.13 -12.25
NYS 17.63 9.50	Tandem Computers Inc.	12.25 -0.25 -2.00
OTC 4.75 1.25	Tandem Corp.	1.44 -0.06 -4.13
NYS 11.75 3.25	Unisys Corp.*	9.75 -0.13 -1.27
ASE 7.50 2.00	Wang Labs Inc. (H)*	5.25 -0.88 -14.29

Software & DP Services

Off 6.38%

OTC 68.50 41.25	Adobe Systems Inc.	53.25 -1.50 -2.74
OTC 13.25 3.50	Altair Corp.	7.88 -2.00 -20.25
OTC 59.88 24.75	Aldus Corp. (L)	24.75 -1.50 -5.71
OTC 19.75 10.13	American Software Inc.	18.50 -0.63 -3.35
OTC 20.00 7.13	Ask Computer Systems	15.13 -2.00 -11.68
OTC 62.25 23.25	Autodesk Inc.	31.50 -0.50 -1.56
OTC 21.75 17.00	Bachman Inc.	22.50 -2.00 -8.89
OTC 42.50 25.88	BGS Systems Inc.	35.00 -1.00 -2.78
OTC 79.00 33.00	BMC Software Inc.	56.25 -7.00 -11.07
OTC 19.50 8.75	Blais & Sabatage (H)	0.25 -0.13 -33.33
OTC 86.75 39.50	Borland Int'l Inc.*	54.00 -14.50 -21.17
OTC 11.25 4.75	CE Software	8.13 -0.63 -7.14
OTC 19.75 6.50	Cheyenne Software Inc.	0.67 0.00 0.00
OTC 20.88 7.50	Cognos Inc.	8.50 -0.13 -1.45

Exch 52-Week Range

NYS 17.00 7.25	Computer Associates*	15.25 -1.50 -9.96
OTC 22.75 12.00	Comshare Inc.	17.25 -0.25 -1.43
OTC 47.88 15.00	Eastl Corp.	36.00 -5.25 -12.73
OTC 15.75 9.25	Gold Systems Int'l	12.75 -2.00 -13.56
OTC 32.50 11.50	Group I Software	20.63 -1.13 -5.17
OTC 7.00 4.50	Hogan Systems Inc.	5.38 -0.25 -4.44
OTC 13.25 6.50	Informatica Resources	26.75 -0.50 -1.83
OTC 33.00 5.13	Inform Corp.	27.88 -2.75 -9.88
OTC 3.63 1.06	Intellipoint Inc.	1.88 -0.06 -3.25
OTC 43.25 10.50	Intergraph Corp.	17.38 -1.88 -9.74
OTC 15.00 4.88	Interleaf Inc.	11.50 -0.75 -6.12
OTC 20.25 7.38	Intersync Inc.	18.00 0.38 2.13
OTC 45.25 20.25	Knowledge Software Inc.	14.63 -2.38 -13.97
OTC 40.75 18.00	Legent Corp.	38.25 -1.25 -3.16
OTC 7.38 11.50	Lotus Development*	31.50 -5.38 -14.58
OTC 22.25 11.50	Meta Software	9.13 0.38 7.89
OTC 30.25 9.75	Mentor Graphics	16.63 -2.13 -11.33
OTC 16.63 6.50	Micrographs Inc.	23.00 -3.25 -12.38
OTC 21.13 7.00	Microsoft Corp.*	121.25 -7.25 -5.64
OTC 35.63 11.50	Oracle Corp.*	13.88 -2.00 -12.60
OTC 10.75 5.88	Parametric Technology	28.38 -1.88 -6.20
OTC 46.50 27.50	Phoenix Technologies	9.25 -0.50 -5.13
OTC 46.63 27.50	Progress Software Corp.	41.25 -3.75 -8.33
OTC 25.25 9.00	Quartermark Office Sys.	18.75 -0.75 -3.85
OTC 29.75 10.00	Rasterops	20.00 -1.75 -8.05
OTC 17.25 6.75	Ross Systems	12.75 -2.50 -16.39
OTC 26.25 12.50	Software Publishing Corp.	21.88 -2.13 -9.65
OTC 8.50 2.00	Software Toolsworks Inc.	6.13 -0.75 -10.91
OTC 7.25 1.75	Spinner Software	4.75 -0.38 -7.32
OTC 16.63 6.50	State of the Art	12.75 -0.88 -6.50
OTC 25.25 10.68	Stirling Software Inc.	21.25 -0.50 -2.30
OTC 30.00 15.88	Strat. Dynamics Research	18.25 0.00 0.00
OTC 31.75 15.00	Sysbase Inc.	27.75 0.50 1.80
OTC 19.50 19.50	Symantec Corp.	15.50 -5.00 -11.70
NYS 15.00 6.63	Systems Center Inc.*	11.25 0.63 5.88
OTC 31.00 8.34	System Software Assoc.	28.50 -0.50 -1.72
OTC 6.63 2.75	Wordstar	3.75 -0.25 -6.10

Semiconductors

Off 5.10%

NYS 21.50 8.38	Advanced Micro Devices	17.50 -1.73 -6.04
NYS 12.88 6.75	Analog Devices Inc.	9.88 0.13 1.28
OTC 18.88 7.00	Altmet Corp.	9.75 -0.63 -6.02
OTC 18.88 7.00	Chips and Technologies	10.38 -1.25 -10.77
NYS 24.50 13.38	Cypress Semiconductor Corp.	13.63 -2.13 -13.49
NYS 12.38 6.25	Dallas Semiconductor	9.13 0.25 2.82
OTC 38.50 15.00	Intel Corp.*	56.25 -9.75 -15.00
NYS 12.50 6.50	LSI Logic Corp.	7.75 0.00 0.00
NYS 22.38 10.88	Macron Technology	15.63 -0.50 -3.10
OTC 54.00 25.00	Motorola Inc.	9.25 -0.25 -2.50
NYS 11.50 3.88	National Semiconductor*	9.88 -0.63 -5.95
OTC 27.00 13.00	Sierra Semiconductor	16.00 -1.38 -7.91
OTC 47.63 26.00	Siemens Instruments*	32.75 -1.50 -4.38
OTC 12.25 5.88	VLSI Technology	6.75 -1.13 -11.39
OTC 16.75 4.50	Wetleek	5.13 -0.38 -6.82
OTC 32.50 19.25	Zilog Inc.	26.25 -3.25 -11.02
OTC 11.50 4.25	Xilinx	9.13 0.38 4.29

Peripherals and Subsystems

Off 1.25%

OTC 2.75 1.00	Apertus Technologies	1.81 0.44 31.85
OTC 8.13 3.13	Archive Corp.	8.75 0.13 1.54
OTC 24.00 11.25	Banclic Inc.	23.25 0.00 0.00
OTC 23.50 4.88	Cambex Corp.	17.00 -1.38 -7.48
ASE 12.13 8.00	Cognitronics Corp.	12.13 0.00 8.99
NYS 23.00 12.50	Conner Peripherals*	19.50 -1.13 -5.45
ASE 59.00 9.63	Dataram Corp.	54.13 3.88 7.71
NYS 16.88 4.88	EMC Corp.	15.50 -1.75 -11.48
OTC 11.25 5.75	Emulex Corp.	5.88 0.00 0.00
OTC 23.00 14.75	Evans & Sutherland	16.75 0.50 3.08
OTC 40.63 13.38	Exabyte	33.13 -4.38 -11.67
OTC 27.25 14.75	Intelligent Info. Systems	9.00 -0.13 -1.43
OTC 11.25 4.00	Iomega Corp.	8.38 0.00 0.00
OTC 33.50 14.50	ITL Systems Inc. (H)	32.50 -0.50 -1.52
OTC 34.50 11.75	Komag Inc.	14.63 -3.38 -2.50
OTC 12.25 1.63	Maxtor Corp. (H)	11.25 -0.75 -6.25
OTC 18.00 5.00	Microplus Corp.	10.13 -1.38 -11.96
NYS 88.75 83.50	3M Corp.	88.25 -0.25 -0.22
OTC 10.00 3.50	Printonix Inc.	6.50 1.00 18.18
OTC 18.13 8.88	QMS Inc. (L)	10.63 -0.25 -2.30
OTC 18.13 8.88	Quantum Corp.	16.00 -0.38 -2.39
OTC 12.25 5.00	Radius Inc.	9.50 -0.50 -5.00
OTC 12.88 5.75	Recognition Equipment	10.75 -1.13 -9.47
OTC 12.13 8.00	Rexon Inc.	11.88 -0.25 -2.05
OTC 19.88 7.13	Seagate Technology*	12.88 -2.25 -14.88
NYS 78.00 32.75	Storage Technology*	61.88 -6.13 -9.01
NYS 30.88 16.00	Tektronix Inc.	18.88 -0.75 -3.82
OTC 1.06 0.16	Televideo Systems	0.81 -0.13 -13.33
NYS 82.25 51.50	Xerox Corp.	73.00 -3.88 -5.04

Services

Off 3.93%

OTC 28.50 16.25	American Mgmt. Systems*	20.00 -1.50 -6.98
NYS 5.38 2.88	Anacom Inc.	4.88 -0.13 -2.50
OTC 19.00 12.00	Analysts Int'l	17.25 0.00 0.00
OTC 49.00 29.50	Auto Data Processing*	45.88 -0.13 -0.27
NYS 26.78 14.25	Comdisco Inc. (L)	14.25 -0.50 -3.45
OTC 14.50 7.75	Computer Horizons	10.25 -0.50 -4.65
OTC 84.88 52.25	Computer Sciences*	68.00 -1.38 -1.98
NYS 11.25 7.00	Computer Task Group	9.50 0.00 0.00
OTC 29.25 12.75	Corporate Software	16.63 -0.13 0.75
NYS 33.06 21.88	Egghhead Discount Software (H)	27.75 -0.75 -2.63
OTC 19.25 7.75	General Motors E (EDS)*	28.63 -1.25 -4.18
OTC 29.25 12.75	Intelligent Electronics	20.50 -1.50 -6.82
OTC 14.88 2.25	Mensel	13.25 -0.38 -2.75
OTC 15.75 5.75	Microage Inc.	12.00 -1.00 -7.69
OTC 41.25 19.50	Paychex	33.25 -3.25 -9.80
NYS 73.00 43.25	Payroll Management Sys.	68.88 -0.63 -0.90
NYS 41.18 75.75	Reynolds and Reynolds	38.00 -2.00 -5.00
OTC 32.00 21.25	SEL Corp.	28.75 0.75 -2.54
OTC 24.38 16.13	Shared Medical Systems	19.88 -1.63 -7.56
OTC 24.38 13.50	Sungard Data Systems	22.50 0.75 3.45
NYS 6.13 1.13	Ultimate Corp.	2.25 -0.38 -14.29

Source: Brokerage firm reports

CW Chart: Janell Genovese

Note: Cisco Systems completed a 2-for-1 split.

COMPUTER INDUSTRY

IN BRIEF

AT&T loses lawsuit

■ The U.S. District Court in Midland, Texas, last week upheld an award of \$34.6 million against AT&T after a jury on Feb. 5 found that AT&T's 5ESS digital telephone switch infringed on a 1976 patent issued to Arthur A. Collins, Inc. Collins, who died in 1987, held patents for digital transmission, switching and network design. One of these, the Collins suit maintained, was appropriated by AT&T Bell Laboratories in its 1982 digital switch. An AT&T spokesman said the company planned an appeal.

■ IBM and Unix systems integrator ERI in Hauppauge, N.Y., struck a deal last week in which IBM will market ERI's services along with its RISC System/6000 systems, other IBM hardware and peripherals to focus on applications in the trading floor environments. The agreement, which will provide AIX-based systems integration services, is said to be the first of its kind for IBM. ERI also works with Sun Microsystems, Inc., NCR Corp. and AT&T.

■ They tallied on the low side of analysts' predictions, but profits for Oracle Corp. jumped nearly 40% for its fiscal third quarter to \$16.8 million, compared with 1991's third-quarter net of \$12.1 million. Sales for the database maker climbed 7% for the period, from \$269.5 million to \$289.6 million.

■ Networking company 3Com Corp. last week posted a third-quarter loss of \$5.4 million. The loss reflects a \$10.4 million onetime charge for the Jan. 31 acquisition of UK-based BICC Group PLC's data networking products business. 3Com said revenue of \$102.3 million for the period ending Feb. 29 represented an 11% increase over the same period last year.

Cray exec jumps ship for Intel position

BY ELLIS BOOKER
CW STAFF

BEAVERTON, Ore. — Intel Corp. last week reached into the corporate suite of supercomputer leader Cray Research, Inc. for an executive to preside over its Massively Parallel Systems Division.

Ed Masi, formerly Cray's executive vice president of marketing, will fill a void at Intel created a few months ago when Robert Rockwell resigned as president of Intel's Supercomputer Systems Division here. Masi's arrival signals Intel's intent to raise its profile in the hotly contested supercomputer business, analysts said.

"At this point in the [supercomputer] industry, marketing

is important and sales aren't driven anymore just by technology," said Gary Smaby, president of the Smaby Group, Inc. in Minneapolis. Individuals with these skills, he added, belong to a short list that is concentrated at Cray, which has been the market leader for years.

Smaby also said Intel wants to be a leader, not only in massively parallel supercomputing, where it has dug out a niche, but in the broader high-performance computing industry. "Masi should be a real asset to that," Smaby said.

Masi, a 12-year Cray veteran, could not be reached for comment. But in a statement last week, he said that massively parallel supercomputing "represents the future of high-performance computing in the 1990s."

The small universe of potential supercomputer buyers will remain a tough audience. "I believe customers choose those machines by their performance, not the people who sell them," said Mary Zosel at the Computing Research and Standards Office at the University of California Lawrence Livermore National Laboratory in Livermore, Calif., and a past president of CUG, the Cray user group.

Direct target

Since its formation in 1984, Intel's supercomputer group has focused exclusively on massively parallel processing (MPP). In MPP systems, hundreds or thousands of relatively simple processors work together to solve very complex equations.

Intel chalked up more than \$50 million in MPP revenue last year, analysts estimated. Other MPP players include NCube Corp., based here, and Thinking Machines, Inc. in Cambridge, Mass.

Even Cray has revealed an interest in massively parallel systems in recent years. Cray's three-phase MPP project, based on the Alpha chip from Digital Equipment Corp., calls for a hybrid MPP machine in 1993 that works with existing Cray Y/MPP processors.

Analysts said Intel and all other MPP vendors face a technical challenge: to create software needed to optimize these systems. That could be an advantage to Cray, already well-known for its software tools.

Windows-compatible sales surge

BY KIM S. NASH
CW STAFF

WASHINGTON, D.C. — If you bought a Microsoft Corp. Windows-compatible spreadsheet last year, you are certainly part of the "in" crowd.

Sales of Windows packages in 1991 grew 228% vs. a growth rate of 37% for Apple Computer, Inc. Macintosh packages, according to a recent report from the Software Publishers Association (SPA), based here. Split by application function, spreadsheet sales grew faster than other major categories in 1991, including word processing packages (see chart).

Overall, users spent \$5.7 billion on all subsets of personal computer applications last year,

up 25% from 1990's total sales of about \$4.6 billion, the SPA report said.

"The recession was alive and well on the hardware side, but it hasn't affected PC software," said David Tremblay, the SPA's research director. That is because users are investing more money than ever before to make PC installations "as reliable, stable and feature-rich as mainframe operations have traditionally been," he added.

That means utility software, such as antivirus and file-recovery programs, sold well in 1991. Sales of these products grew 33%, from \$130 million in 1990 to \$174 million in 1991.

The only discrete sector where revenue dropped year over year was desktop publish-

ing, where sales fell just under 9%. Some industry analysts attributed the decline partly to the fact that high-end word processors now contain many desktop publishing features and are stealing market share.

Word processing remains the

largest dollar-value sector, with estimated 1991 sales of \$1.1 billion, an increase of 24% over 1990's \$918 million.

Tremblay could not pinpoint what percentage of 1991's sales were upgrades to existing installations vs. new business, but he said upgrades have "accounted for an increasing portion of business over the past few years."

WordStar to buy Delrina in \$50 million stock deal

BY CAROL HILDEBRAND
CW STAFF

NOVATO, Calif. — WordStar International, Inc. said last week it will acquire Delrina Corp., an office applications developer, in a stock deal valued at approximately \$50 million.

WordStar will issue between 11.5 million and 13 million of its own shares for all outstanding Delrina stock, according to a letter of intent signed by both parties.

Ron Posner, WordStar's chief executive officer, said he will lead the \$56 million merged entity, whose name has yet to be determined. It will be based at WordStar's corporate headquarters here, although Delrina's development and technical support teams will continue to work out of Toronto, Delrina's base of operations.

"The good news is that the companies are a nice fit in terms of product line," Posner said. "There are lots of areas [where] we can help Delrina expand sales." He pointed to the over-

seas market, from which WordStar derives 55% of its revenue, as an example. Delrina products will be funneled into WordStar's worldwide distribution channel after the merger is completed.

Delrina's two product lines consist of its Perform family of forms software and Winfax, which allows users to send and receive faxes from within a Windows application.

Mary Conti Loffredo, an analyst at International Data Corp. (IDC) in Framingham, Mass., did not see as glove-like a fit, however. "I see the Winfax product as being more compatible with WordStar's product line. The Perform line does not have such broad appeal," she said.

Delrina and WordStar both reported losses in the last quarter, while WordStar's share of the word processing market it once dominated has slipped to less than 5%, according to IDC.

Posner acknowledged financial difficulties. "There are going to be some economies, but we are not planning any immediate layoffs," he said.

Soaring software

Estimated North American microcomputer software retail sales for 1991 (in millions)

	PC/MS-DOS	Macintosh	Other	Total*
Entertainment	\$309.4	\$25.0	\$31.8	\$376.0
Education	\$117.5	\$30.2	\$56.8	\$215.9
Word processors	\$975.1	\$124.3	\$35.9	\$1,136.0
Spreadsheets	\$774.4	\$136.0	**	\$946.7
Databases	\$351.3	\$43.6	\$1.0	\$396.8
Integrated	\$122.0	\$32.7	\$9.3	\$163.6
Graphics	\$495.4	\$209.4	\$19.6	\$724.4
Desktop publishing	\$103.6	\$44.9	\$2.7	\$152.6
Language/Tools	\$151.5	\$16.3	\$1.2	\$173.6
Other productivity	\$1,180.8	\$174.9	\$48.1	\$1,418.1
Total*	\$4,573.3	\$840.8	\$263.7	\$5,713.2

* Totals have been rounded. ** Sales of less than \$1 million or in which too few firms report.

Source: Software Publishers Association

CW Chart: Michael Higgins

WYSIWYG

Design by Michael Siggins



you don't want to get rid of!

The wave of the future is HIPPCUDs, predicts Steven W. Gilbert of Educom, a university consortium that focuses on information technology. HIPPCUDs are Highly Intelligent, Portable, Powerful, Cheap, Unobtrusive Devices that you can stick in your pocket for communications and information management.

It had to happen

Stewart Lewis, micro-computer specialist at Healthcare Management Alternatives, Inc. in Philadelphia, is known as the health care company's "computer doctor" for his vaccination of the company's PCs against the Michelangelo virus. Rumor has it that Lewis is working on "diskette condoms" to prevent the further spread of computer viruses. "After all," Lewis said, "I don't know where your disks have been."

— from the HMA internal newsletter

GREAT names

Melissa Finder
Recruiter, Amdahl Corp.



Perestroika pirates

Did you know that there is a user group in the Soviet Union for Computer Associates' IDMS mainframe database product? The only problem is, the product has never been sold there legally.



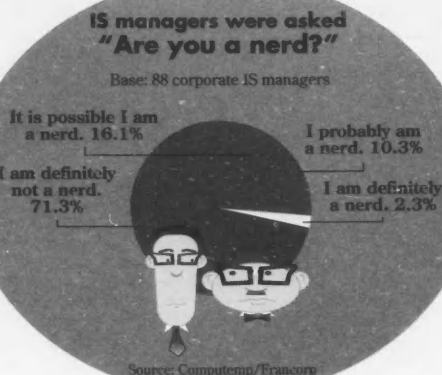
The world's longest bar-code label:

375 feet long, placed around the base of the Palomar Observatory to indicate dome positioning.

The world's smallest bar-code label:

2.8 millimeters, applied to bees' thoraxes with shellac to monitor behavior.

Sources: *Computerwoche*, an IDG Communications publication in Germany; *The Chronicle of Higher Education*; *ID Systems* magazine.



Just remember to keep the day job

The Interactive Music Co. in San Francisco has developed a computer program called "So You Want to Be a Rock & Roll Star?" The \$99 program — which is in beta testing and will be available on CD-ROM for the Apple Macintosh — includes basic music theory and tutorial music lessons.



Say it three times fast

Germany's Schutzgemeinschaft frallgemeine Kreditsicherung (Schufa), a protective association of lenders and businesses dealing with credit transactions, has put Debit Systemhaus GmbH, a Leinfelden-Echterdingen-based Daimler-Benz subsidiary, in charge of all its IS services.

I was a teenage mainframe



J. C. Hagan, manager of financial/personnel systems at Monsanto Co. in St. Louis, on why he's shopping around to replace some of his mainframe applications: "These applications are like dealing with teenagers, and you know how they are. They don't do what you want, and they never listen."

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

INSIDE LINES

Public enemy

► When Novell adds a new security level — public — to its NetWare Version 3.2 this fall, it may lose some revenue from users skirting licensing limits. Companies could assign full privileges to "public," and, because public users do not count against the embedded license limits, network administrators could put as many users as they choose on the server. The trade-off, of course, is that there are no security features protecting the public level, according to a Novell technician who worked on 3.2.

Lion's den

► Microsoft's Steve Ballmer managed to get just a smattering of applause from Novell developers last week when he said Window's New Technology (NT) will be demonstrated on NetWare this summer. He was one of many unexpected speakers at a conference in Salt Lake City. Novell officials said they are "in lock-step with NT development." NT on NetWare will ship when NT does later this year, officials said.

Reach out and swipe something!

► A network hub vendor tells us of a Wall Street brokerage firm whose 10Base-T LAN connections mysteriously started disappearing, one by one. It turned out that the telephone company was putting in

new lines, and, after finding no dial tone on the patch panels that supported 10Base-T connections, assumed that they were there for the taking. This little misunderstanding reportedly cost the customer an estimated \$3 million — Ouch!

Low tide

► Hewlett-Packard's \$195 NewWave 4.0 has hit the streets, but early indications are that the update has run into the same problems as its beleaguered predecessors. Some early users have complained about hour-long setup times and the fact that NewWave slows down Windows. HP claims users no longer have to buy specially modified applications, but some users have complained that when they simply tried to start an application, NewWave took them through a complex set of steps designed to modify the program.

AS/400 array

► IPL Systems will soon announce an IBM AS/400-compatible disk array, replete with what it claims is an industry first: a three-year warranty. A fully populated, 3.4G-byte system — totally compatible with the IBM 9336 — will carry a list price of \$32,000, which translates into approximately \$9 per megabyte.

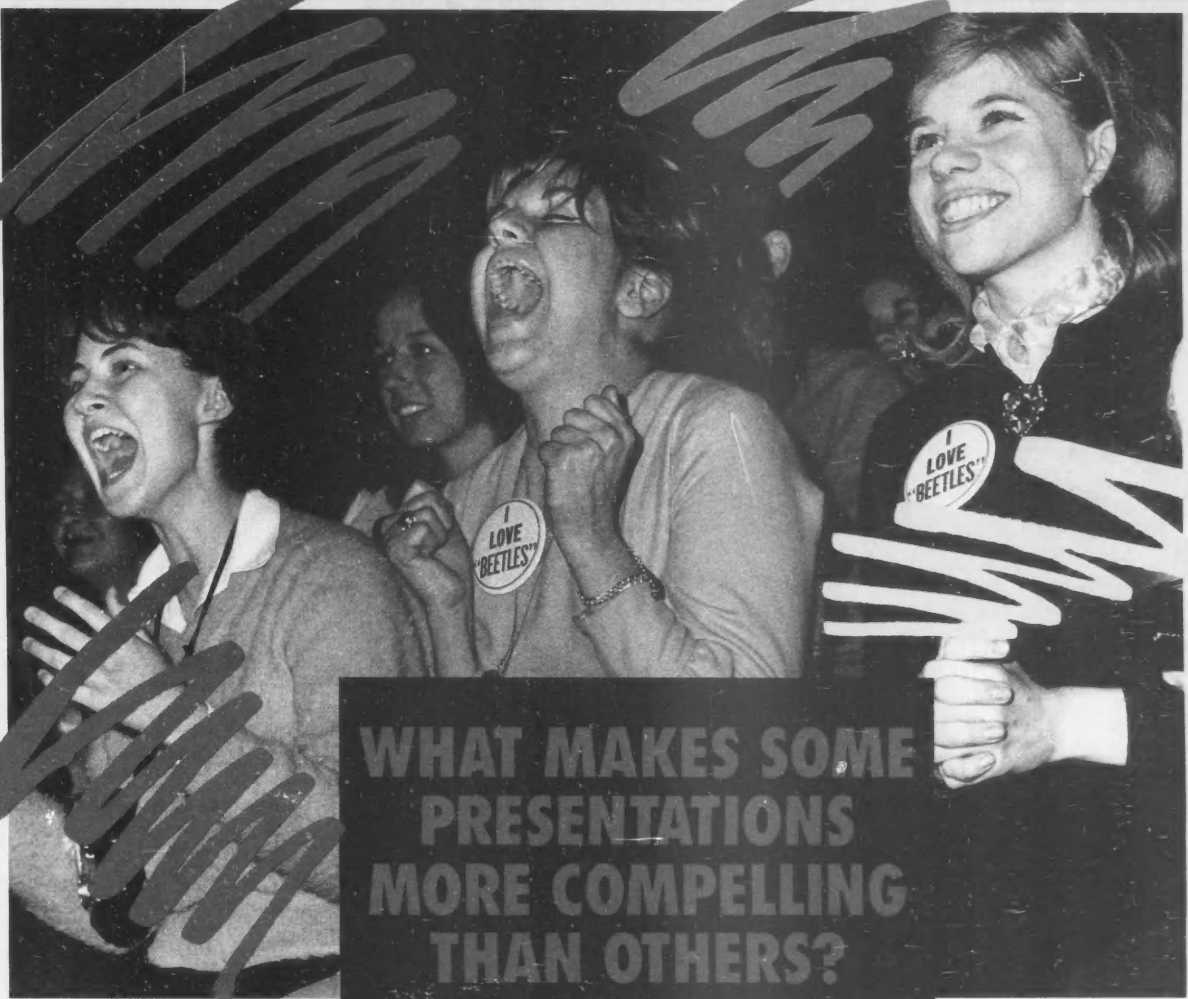
Gaining Momenta

► Former Apple executive Delbert Yocam is reportedly close to becoming the COO at Momenta Corp., the ambitious but struggling Mountain View, Calif., pen computer maker, industry sources said last week. Yocam would take over many of the firm's management responsibilities from Chairman and founder Kamran Elahian. Momenta's sales have been below expectations since its product unveiling last year, which some analysts attribute to the company's decision to use a proprietary operating system.

New heights

► Top-end Data General users with maxed-out proprietary MV 40000 minicomputers will be able to upgrade to a new model starting April 7. DG is set to unveil a machine that is at minimum 20% faster than the current high-end MV 40000, which tops out at 54 MIPS, sources close to the company say. A new version of DG's office automation system, CEO — a key application for the proprietary line — is due out about a week after the new MV, the sources said.

During an onstage demo of NextStep object-oriented programming features in San Francisco last week, Next CEO Steve Jobs slipped in a political endorsement, of sorts, for Next investor H. Ross Perot. The billionaire industrialist recently said he would run for president if volunteers could get his name on the ballot in all 50 states. Jobs' endorsement came during a multimedia application that played a voice-mail greeting from Perot to Jobs. "He'd be a really awesome president," Jobs jabbered. Got any news tips? Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively.



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